MODEL AIRPLANE NEWS

Gloster GA-5

JUNE 1952 - 25 CENTS

Plymouth announces the 6th International Model Plane Contest

AUGUST 20 THROUGH 25—DETROIT, MICHIGAN

Bigger, better, more exciting than ever, the 1952 "Olympic games of model aviation"—the 6th International Model Plane Contest—will be staged by Plymouth Motor Corporation in Detroit, Mich., next August 20-25.

There will again be superb flying arrangements for free flight events, with plenty of room and every facility for retrieving planes. There will be excellent conditions, too, for speed, stunt, flying scale and carrier deck events. The annual banquet will again highlight the entertainment program.

The competition is divided into three different age groups: Freshman—8 years old, but not yet 12; Junior—12 to 15, but not yet 16; and Senior—16 to 20, but not yet 21. Ages are calculated as of July 1, 1952.

Here's a list of events and awards for 6th International

FRESHMAN

Outdoor Rubber (Unlimited)
Hand Launched Glider, Class A
Free Flight Gas, Class ½A
Control Line Speed, Class A
Control Line Stunt, Class ABCD

FRESHMAN AWARDS:

1st, 2nd and 3rd Places—Trophies
High Point—Trophy and $100 Bond
2nd High Point—Trophy and $50 Bond
3rd High Point—Trophy and $25 Bond

JUNIOR

Outdoor Rubber (Unlimited)
Free Flight Gas, Classes ½A, A, BC
Control Line Speed, Classes A, B, CD
Control Line Speed, Jet
Control Line Stunt, Class ABCD
Control Line Scale, Class ABCD
Control Line Team Racing, Class B
Navy Carrier Deck
Combat

JUNIOR AWARDS:

1st Place—Trophy and $100 Bond
2nd Place—Trophy and $50 Bond
3rd Place—Trophy and $25 Bond
High Point—Trophy

SENIOR

Outdoor Rubber (Unlimited)
Hand Launched Glider, Class A
Free Flight Gas, Classes ½A, A, BC
Control Line Speed, Classes A, B, CD
Control Line Speed, Jet
Control Line Stunt, Class ABCD
Control Line Scale, Class ABCD
Control Line Team Racing, Class B
Navy Carrier Deck
Combat

SENIOR AWARDS:

1st Place—Trophy and $100 Bond
2nd Place—Trophy and $50 Bond
3rd Place—Trophy and $25 Bond
High Point—Trophy

A Youth Activity Sponsored by **Plymouth**

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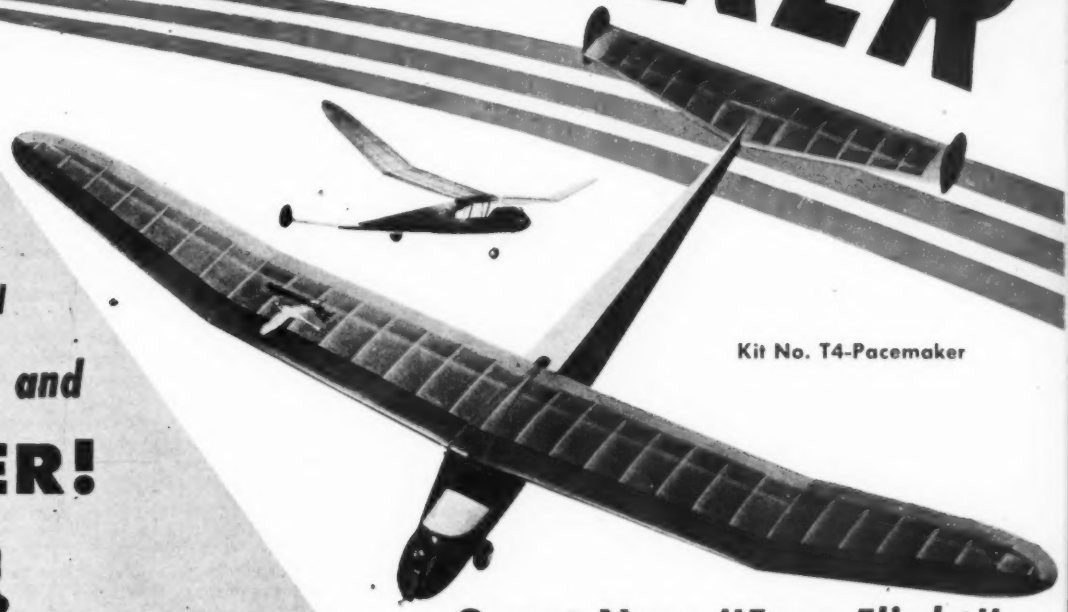
• For complete details, rule books and entry blanks, see your nearby Plymouth dealer. Entries close July 27, 1952.

COMET Launches the PACEMAKER



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JUNE 1952 VOL. XLVI-No. 6

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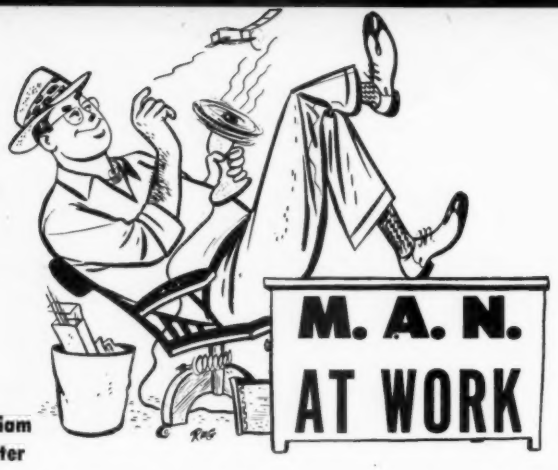

by William Winter

Modelers everywhere really do speak the same language. You don't know what the other guy does for a living or even where he lives. He may be a millionaire or down to his last can of Blast. At M.A.N., this is true on a global scale. Letters arrive from East Africa, Argentina, Sweden, Borneo, India, Italy, Japan, Norway, Israel, Mexico, Alaska, the Philippines, Britain, from virtually every country but Russia. Letters from behind-the-iron-curtain countries ask about plans, engines, props; the same things that they want to know about in Brooklyn or Chicago. Wish everyone in the world built models. Wars? Poof!

So among the visitors this month was Fritz H. Horn, well known modeler and contributor to a German magazine. His is the serious European approach, strong on theory, research, and experimentation. Fritz arrived with a gleam in his eye and out of breath to tell us why one of Dr. Lippisch's deltas did certain things. While we fell off on the second sharp turn, the two hour discussion (and, being modelers both of us, occasional near arguments) about American rule-of-thumb methods, was a broadening experience. Cocksure U. S. contest boys should be subjected to the impact of some of these arguments. Learned some fantastic things about air flow over model airfoils—they have a low Reynolds number tunnel perking in Cologne—and about radical sections. Fritz promised to write a couple of articles on bird sections and the European approach. Claims lifting tails are a swindle. Tried to tell him that we used lifting tails to keep pylons headed in the right direction. Tried, that is. Balsa is scarce in Germany. Plywood and hard woods widely used. Towline is popular. Only it isn't towline. Hand-launchings and ridge soaring, mostly in the Rhon mountains.

Bill Jones, guy we met at a flying session of the *Father and Sons Club* in North Jersey, made us miss a lunch with wild stories of modeling progress across the Hudson. Bill is a Pennsy electric choo-choo pusher between New Yawk and Harrisburg. Also a ham—radio variety. Meets himself coming and going. Mentioned Joe Pedrant who makes his own engines. Stories of a Fox *59 Chief* on 80-foot lines that does double verticals. Of 11-ounce team racers made of metal. A six-foot *Catalina* with two Fox *35's* and retractable tip floats. Also a team racer that does 60 laps to the ounce on a Mac *29* ignition. No batteries or coil in the plane. Insulated lines carry the juice. A six-volt battery allows for voltage drop on the lines. Puzzles everybody when the builder flips the prop with no boosters in sight. Beauty of the idea is that the 60 laps are flown at high speed.

Purcell arrived with the birds one a.m. with latest poop on ducted fans. Remember the little Lockheed in his article? Is gone. Out of sight. Hope to have a plan of a "jet" scale pretty soon. If you missed his article, the deal was an internally mounted engine with a wide bladed metal fan in the tunnel. Bill Effinger, Berkeley, is experimenting with the same idea. Bill, however, wants it for control line which is a horse of a different color. Hank Struck, his designer, tied an *F-86* ducted fan fuselage with a .19 on the back of a six foot free flight. It flew fine. But getting up to 40 miles on ground for take-off in U-control is ticklish problem.

A chat with Frank Ehling about breaking the Russian endurance record of five or six hours. Would use rc to keep the plane around. Means long life, fat batteries, loads of fuel and probably a diesel. Quick mental arithmatic indicated some six pounds of juice for a relatively small engine. Don't writ this one off for he is apt to do anything. . . . Cal Smith is the proud poppa of a new model annual published by Fawcett called *Model Building*. It contains seven free flight items, 15 ukie deals, six boat, two car, and about nine other features. Six bits on the newsstands.

Harry "Design Detail" Williamson, with some humorous stories about U-control. The three-view in installment on stunt is a real airplane and will appear in a future issue, but with an upright (*Continued on page 8*)

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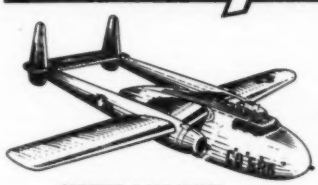
NORTHROP F-89 SCORPION

RUSSIAN MIG-15

GRUMMAN F9F PANTHER

HERE'S 4 BRAND NEW MODELS - EACH A HONEY!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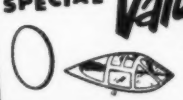
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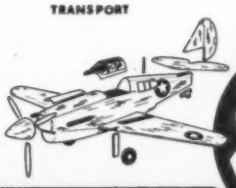

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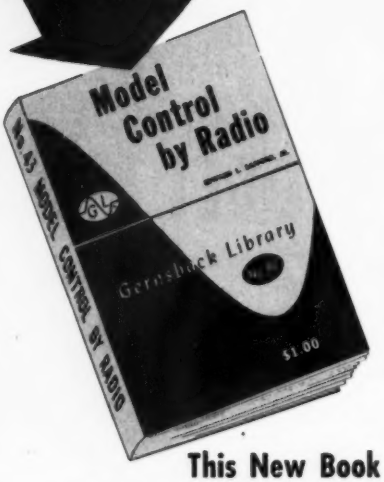

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by Jim Saftig

What's cooking in South Africa? Australia? Your sees-all, hears-all newshound gives out with latest dope.

Pen bladder tank sketched is described fully in text. Joe Bilgri, in top picture, shows off 295 sq. in. indoor "mike" job. Below—Frank Cummings is holding A stick job for son Ronald.

Indoor flying is the safe and calm way to compete in a model contest, but you've gotta convince me. Yours truly has a fat lip—a darned indoor glider "zeroed" out at about 185' at the recent Southern California Model Association's Indoor Contest and your newshound was "clobbered." Nothing lost but a bit of skin and a pound of dignity. Good meet. Site an indoor modeler's dream. Santa Ana Lighter-Than-Air Hanger, 200' wide, 200' high, and a thousand feet long. Not a breath of disturbed air reached the "ghosts." The Navy moved helicopters, *Corsairs*, and anything else that might be a hazard to the far end of the enclosure.

Joe Foster, *Oakland Cloud Duster*, cleaned house with a win in both H. L. glider and rubber. Times 1:13.6 and 25:40.4, respectively, tieing the world's record. Foster's club mate, Joe Bilgri, brought his indoor monster into fourth place with 21:22.9. Bilgri's job packed 295 sq. inches of wing area and was powered with one strand of 1/8 T56. Weight 90,000 of an ounce. Structure perfect, covering excellent, bracings with nichrome wire out of this world. Shaking all over as we think about cementing together one of these fugitives from a hearty sneeze.

Old maestro, Frank Cummings, lent a helping hand to many of the lads who were having trouble and then put his ship into the air for 25:29.2 to take second place. Frank's 10-year old son, Ronald, was putting in some good flights with his very small class A job. The youngster hauled in fourth place with 5:32.5 in the Jr. class. Should give the old man some trouble real soon.

Glider flights were sharp. Main effort besides adjusting, etc., was trying to place the launch in the right place to avoid the walls and rafters.

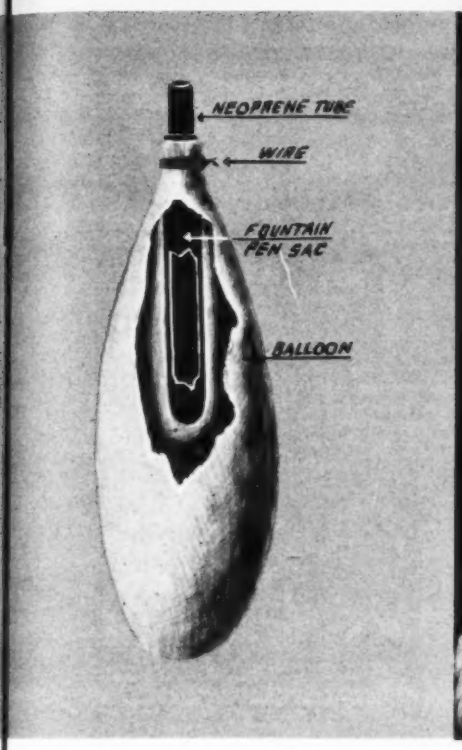
We'd like to plug the free flight and U-control site at this base. The runway at Los Alamitos is well over a mile long and plenty of open space for testing is available. Shouldn't hear any kicks about field layout for the Nat's.

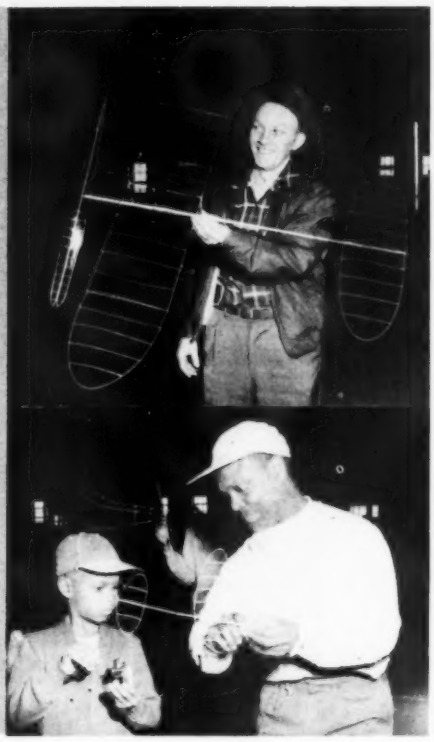
• • •

SIMCOE, ONTARIO, CANADA—The *Sleepless Knights* of Montreal, Quebec, all the name implies. This gang is wide awake and have been set to go to the Mirror Meet in N. Y. for some time. Cliff Morris, President, tells us, group will have a chartered bus. Anyone of you modelers in the area who wants to get in on the charter, contact Bill Elliott, 2083 Bleury St., Apt. 1, Montreal, Quebec, Canada. This bunch is hot for the rubber and AA jobs. Should see plenty of them in the air in conjunction with the *Verdun Optomist* Club on July 13th.

• • •

A re-print of "Are We Forgetting the Kids" (Dec. 51 M.A.N.) has given the flyers in Simcoe, Ontario, an added boost. Meat of the yarn—*Junior Balsa Butchers* (Kansas style) learn to build and fly models with aid of the *Senior Balsa Butchers* and the American Legion. [Each member put two youngsters into action. From novice to a good flyer and builder took but a few months of steady work backed with well instructed programs on all phases of modeling. The novice isn't finished when he gets his wings. Next assign-





ment—pick up two more novices and help win their wings.] Remember the Kansas "punch line" Simcoe—"Hutchinson's Junior flying program may lack Rickenbacker glamour, but it's washing out delinquency."

* * *

SOUTH AFRICA—Enjoyed Pete Visser's quotes on the Western Province Championships via FLYPAPER. Flying done at Phesantekraal drome on beautiful concrete runways. Site also headquarters of the *Western Province Glider Boys* (big stuff). Seems the wind was out in force, but the small ships outdid the big ones. First and second places won by R. Rowe (*Sky Roamer*) and A. Nissen (S.A.M.A.C.) respectively. Interesting note — first, Phoenix (*Wasp*), second, *Civy Boy* (Arden). Seems the lads like the American models too.

Stuart Burnley's father came up with a nice gesture in the way of a swell trophy for competition in the Junior Glider Class. Points divided evenly between construction and flight. Dennis Richardson, whose scaled-up *Walthew* flew O.S.S. in 6 min. 35 sec., was first to win the "mug."

* * *

SYDNEY, N.S.W. AUSTRALIA—Fred Partridge informs us that the Wakefield ships and gliders still hold the spotlight in the land from down under. Saw the picture of the Australian Junior Champ for 1951—Miss Ellaine (Mousie!) Miles. Beautiful gal and mighty fine model (ship looks swell too). Her winners were designed by Partridge and won every Jr. contest they were flown in. Ellaine belongs to a model minded family. Her dad, Gil, not only is a modeler (R.C. etc.) but is a glider pilot also. The R.C. at the present time is a 9' *Valkyrie*. Ellaine's mother also flies gliders (Nordic A2). Won a first last year with a 12 minute O.S.S. flight.

* * *

CORDOBA, ARGENTINA — Friend Victor Pendoza gave us a rundown on some of the doings at the Argentine Nationals. Meet held in Buenos Aires under the direction of the Civil Aeronautics, in collaboration with the Federation of Argentine Aeromodeling. Contestants from Chile and Uruguay also. Victor cracked the record with Dooling *29 Speed Wagon*, attaining 119.05 mph. Slick pics of some entries. Building and finishes were excellent. F.F. times—C. first, Frederico Deis 8.01:0; B. first, Heriberto Gedge 10.-13:0; A. first, Oscar Pabon 14.01:0. Interesting times in Classes as A class held a ratio of high times all the way down the line.

* * *

Questions have been pouring in about the pen bladder tank used in speed jobs. We caught our first look at one about a year ago in one of Chuck "the Cap" Schuette's A jobs. Bill Wisniewski, originator of this particular type of speed job fuel injector, gave us the lowdown on the tank.

First, obtain an ink sac about 1/8" to 1/4" in diameter from a fountain pen repair shop. Be sure it is *natural* rubber as (*Continued on page* 54)

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K & B Glo Torp 32	(C)	18.95
K & B Torpedo 049	(AA)	6.75
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Ohlsson 29 Glo	(B)	13.95
Ohlsson 33 Glo	(C)	13.95
Ohlsson 29 Marine	(B)	14.95
Ohlsson 60 Glo	(D)	13.95
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O.K. Cub .099 Pkge.	(A)	7.95
O.K. Cub .049	(AA)	4.95
O.K. Cub .049	(AA)	6.25
O.K. Cub .049 Pkge.	(AA)	6.75
O.K. Cub .074	(AA)	5.95
O.K. Cub .074 Pkge.	(AA)	6.75
O.K. Cub .049 Kit	(AA)	4.95
O.K. Hothead Glo	(B)	10.95
O.K. Super 60 Glo	(D)	11.95
Royal Baby Spitfire Pkge.	(AA)	5.95
Royal Spitfire	(AA)	7.95
Spitzy	(AA)	6.45
Spitzy Senior Pkge.	(AA)	8.45

IGNITION ENGINES

Cobra	(C)	12.50
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Jumbo Kit	(B)	6.95
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K & B Torpedo 24	(B)	18.50
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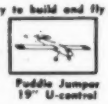

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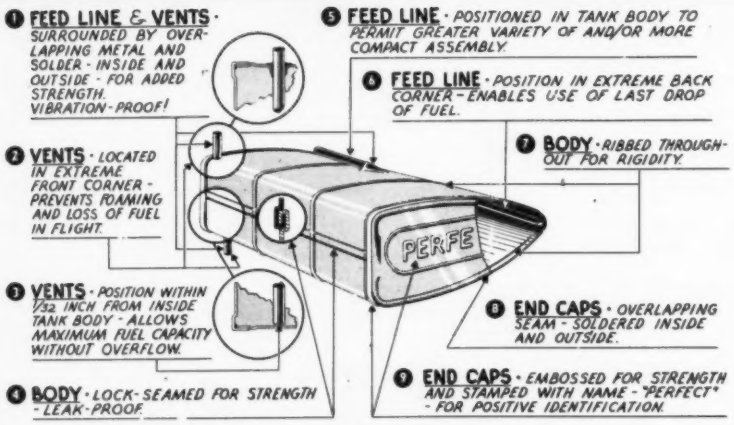

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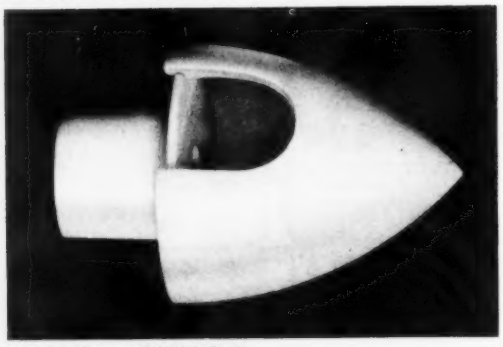

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And this spinner is just a preview of the future. For like all model builders we are dreamers. We like to plan and build newer, better accessories. And you can imagine the kick we are getting out of planning and opening a new field.

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Sullivan Products PHILADELPHIA 38, PA.

M.A.N. at Work

(*Continued from page 2*)

engine. Terrific machine. Harry says that the three-views in every Design Detail represent planes he has built and flown.

▸ The Toy Show hit town. Manufacturers show wares to buyers and take up about eleven floors in several hotels. Visited Carl Goldberg and Mike Schlesinger, Top Flite; Ed Pachasa, Cleveland; Roscoe Guillow and Earl Smith, Guillow; and loads of others, like Testor, Hudson Miniatures, Comet, Wen Mac, Anderson, etc. Anderson has neat new .049, in looks a cross between a *Wasp* and *Royal Spit*. Stack like the *Royal* but runs around cylinder for 360 degree porting. Guillow's exhibit was a veritable flying circus of gliders, scale jobs, ukies, by the many dozens. Testor, a $15 kit of *Freshman* with McCoy 9, all dopes, reel, brushes, prop, the works. Floors you. Great big, colorful box. Grace Vetter, Comet, told us that the non-prefabricated *Gull* and *Clipper Jr.* are holding their own with prefab in the same line and price class. What do you know! Listening to toy buyers is an education as to what kids of under 10 can do. Manufacturers have to plug kits that require no tools, not even a razor blade. When McRoskey, Wen Mac, told one guy that their little Half A, all red plastic control liner did 35 mph, the fellow was alarmed. For a pretty big boy, he commented!

▸ Hatschek on horn to say English Wakefield rules full of loop holes. Trouble is that Europeans go all out to conform to rules while Americans go all out to find the loopholes and go rules one better. . . . Bill Fletcher to ask about M.A.N. ad in Wakefield booklet being put together to help finance team. Had $4,000 at time of writing, but it takes $5,000. Still a wonderful effort and, from where we sit, it shows what can be done when AMA members do work themselves instead of yak yaking about poor, busted down headquarters. We are the AMA and have only ourselves to blame for the things we try to pin on a handy scape goat. So hats off to these stubborn Wakefielders. Bill told us that Cumming's Wakefield takes 2:30 to drop. That was the mystery ship we alluded too some months back. . . . About the remark of a 34-minute indoor flight, New York indoor men tell us only two men in the country could do it: Pete Andrews and Frank Cummings. Wasn't Andrews, said Pete. . . . Fletcher says he uses 60 inches of rubber in 48 inch long Wakefield fuselage. Ed Lidgard puts 50 inches of the stretchy stuff between 26 inch hooks but you have got to know how to wind a snake like that. . . . Put a diesel head—remember them?—on an Arden .19. Hard starting, ragged running, not much pep, compared with true diesel. Diesels have got to have close tolerance on piston cylinder fits. . . . Guys herebouts nuts on AA Fubars. Easy to assemble, fly well, and have minimum of vices inherent to some pylons. . . . While we love that ED 2.46 Diesel, it strips spinners nuts at a glance. If you have this trouble, use Arden .19 prop nuts and front washer . . . using a Walker tank in rc on Arden 19. Secret is not too much rubber. Use five or six small bands which are not stretched very tight. Everybody seems to think the tank needs enough pressure to squirt fuel over the moon. Jim tells us not to poke sticks through hole in regulator, despite directions. . . . Some free flighters tell us you can get one square yard of silk for less than a buck by buying silk kerchiefs. All colors, too. . . . Dragged Artie Hasselbach, Consolidated, out to a Sunday rc session. Artie is running the Mirror meet this year and was looking into rc'ers problems. With this 27.255 stuff coming up, Artie, you'll need luck!

▸ Pete Vacco, the Chicago Wakefield man, says that high aspect ratio props are the thing. We heard this because Pete went on a diet and took the first painful light lunch period to take his mind off things. Last year, he had a 23" club with 1 x 1-1/2 block of about 31 inch pitch. This year it's 24". END.

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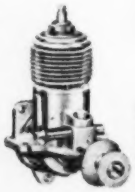

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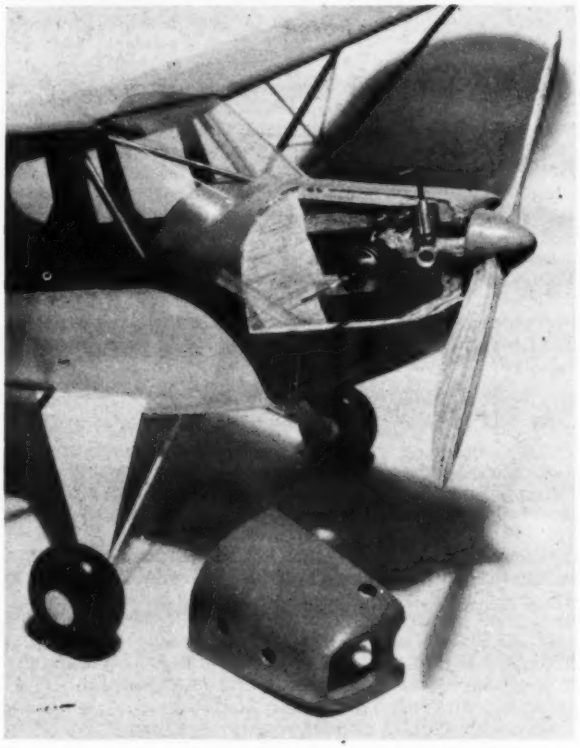
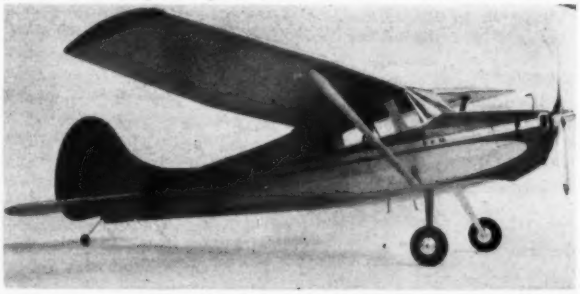
Forty inch Luscombe *Silvaire 8A* weighs 10 ounces, has 178 sq. in. of area. Wing is held in place by internal rubber bands. Power is an .03 Albon *Dart*.

Below—Side-mounted powerplant in Piper *Super Cruiser* showing quarter segment detachable cowl section. Engine, detachable booster tank.



Below—Large stab and long fuselage of Cessna *170* pay off in fine flying performance. Long nose permits one-third chord C.G. without ballast.



TALK ABOUT SCALE!

by BILL DEAN

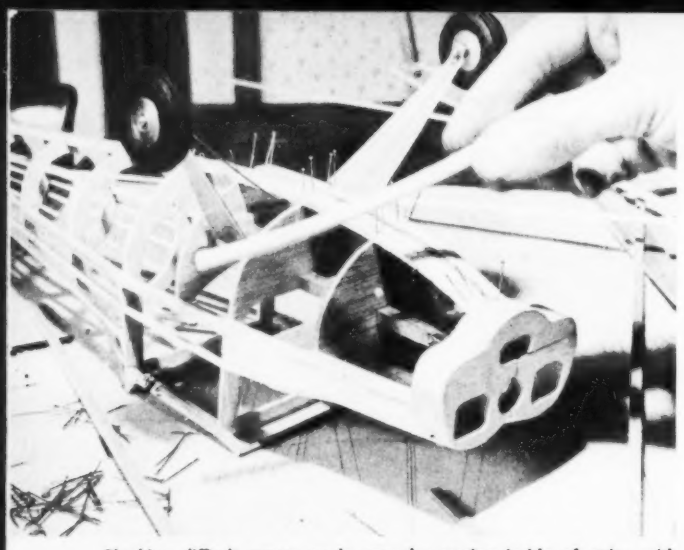
It's the coming thing, this AA scale! You'll want to consider these sound tips for the jobs you will be building in '52.

For sheer fun-flying, there's simply nothing to beat small flying scales. With the fine selection of AA glo-motors available, why not try one for yourself? The following notes are based on our own experiences with models of this type—all of which, incidentally, were developed for a British kit firm.

Our own F/F scale designs have all been powered with the hot little beam mounted .034 *Dart*, which weighs 1-1/4 ounces, and measures only 1-5/16" from shaft center to top of cylinder head. Cowling such a motor is child's play and, in several cases, we have found it necessary to solder an extension to the contra-piston lever. Glo-motors like the *Wasp* .049, O. K. *Cub* .039, and *Infant* .02 also have easy-to-cowl dimensions. Even the lofty *Spitzy* .045 can be tucked away on its side in a Luscombe *Silvaire* or Stinson *105* cowl.

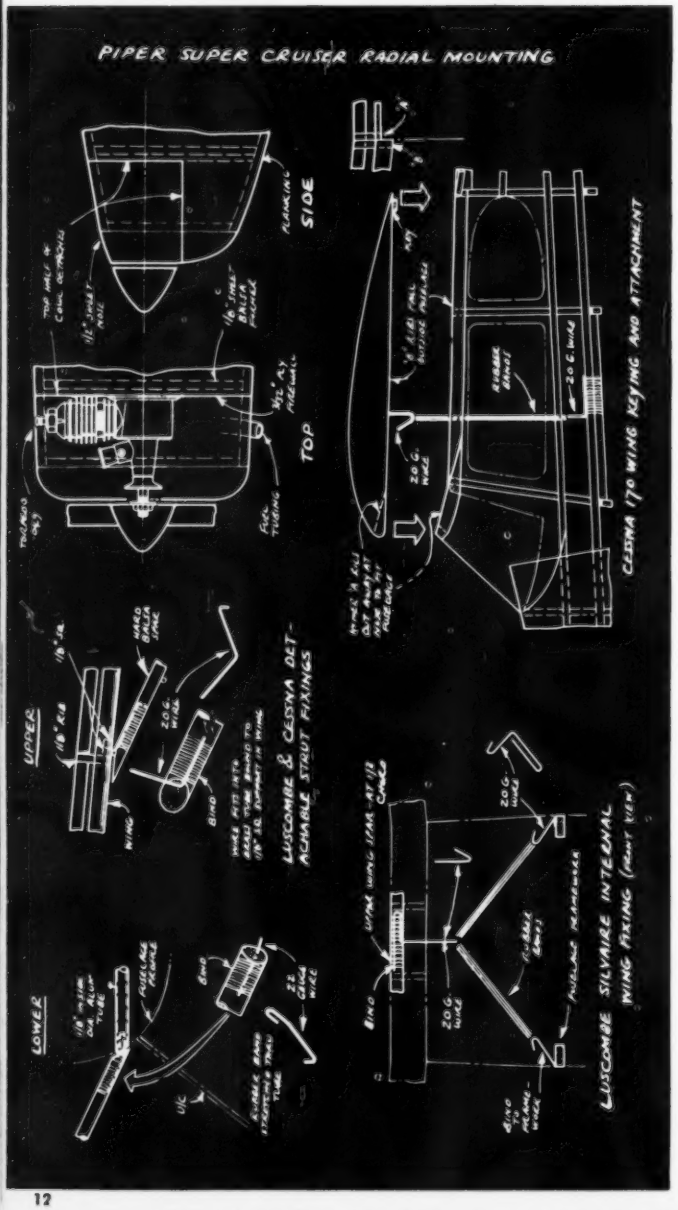
To avoid the complication of a fuel cut-out and timer installation, motor run is best limited by running up on an outside "booster tank," which can be detached just before launching, the motor running on the fuel remaining in the neoprene tubing.

Pendulum controlled rudder and elevators make it possible to fly just about anything with wings on, but take our advice and settle for a design that can be made to perform without the use of such gadgets. The ideal flying scale model is still the ever popular, high-wing cabin, as typified by the Taylorcraft, Monocoupe, Aeronca, Rearwing, Stinson and others. On our own list for future building is the new PA-20 Piper *Pacer*, which differs from earlier Pipers in featuring marked downthrust and a sim-



Planking difficult curves made easy by scoring inside of strips with thumb nail every quarter inch or so. Note dural landing gear.

Finished *Silvaire* nose detail. Notice detachable cowl, fuel tubing, dural gear, wing retaining device, the general rugged construction.

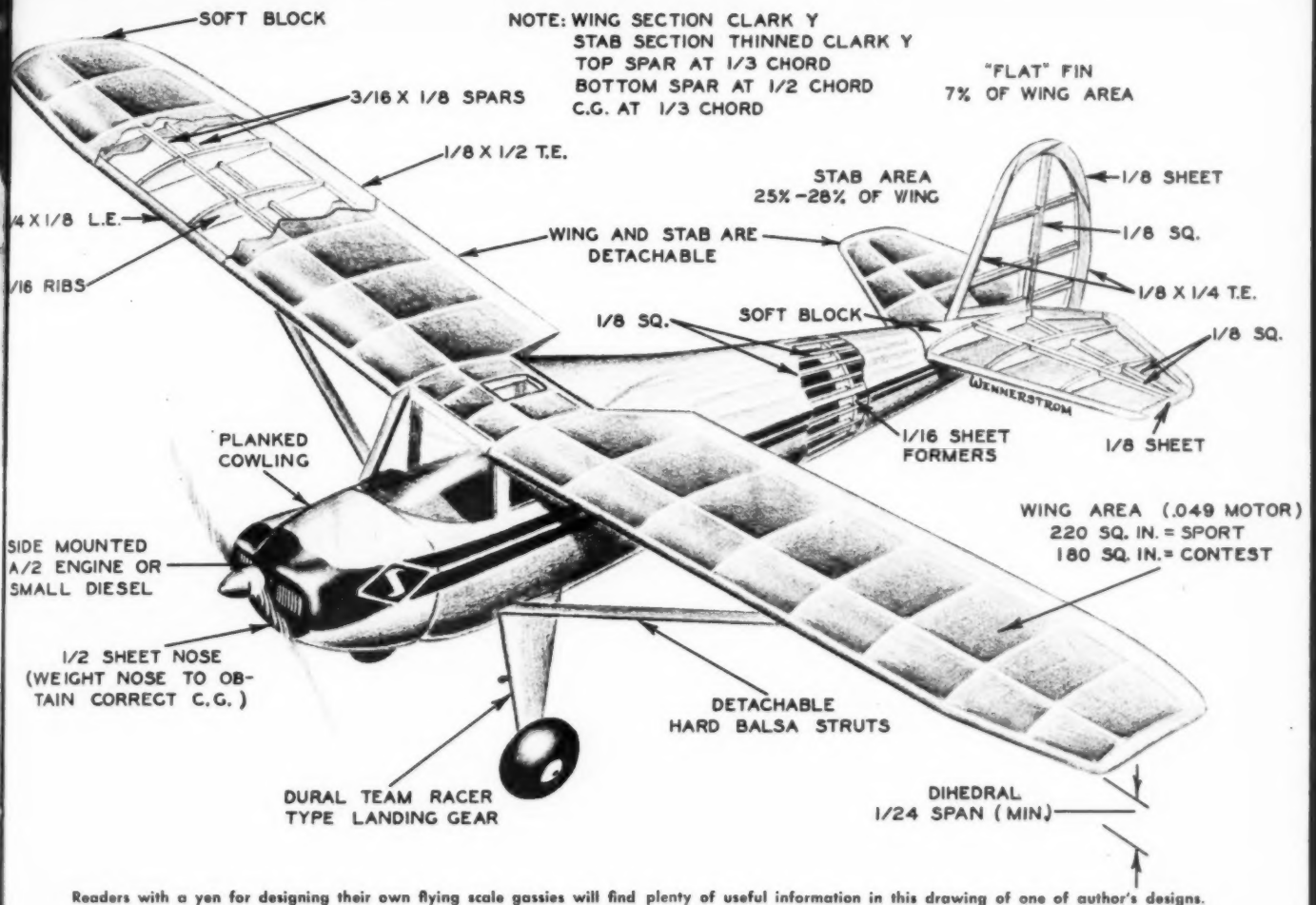


plified strut arrangement. A trike equipped version of the PA-20 (the *Tri-Pacer*) would make a change from the usual conventional two-wheel type. The parasol wing mounting and generous tail surfaces of the World War I Fokker *D-8*, make this another fine scale design and, for contest performance, we put our money on it every time.

In almost every case, scale area tail surfaces are too small from a modeling point of view—the amount of increase depending on the moment arm between the wing and tailplane, but a good average figure for tailplane area on a model of Piper proportions is 25 to 28 per cent of the wing area. Dihedral should be at least 5-1/2° or 1/2" under each tip for every foot of wing span. You may get away with slightly less on both counts, if you keep the engine power low, but who wants to live on the edge of a cliff! Nose weight is usually needed to shift the C.G. forward to the normal cabin F/F position of 33 per cent wing chord. In some cases, as with the long nosed Cessna *170*, the power plant weight may be sufficient, but this is too much to hope for on most models.

Turning to plans, most manufacturers will be pleased to help out with G.A. drawings if you write and tell them that you wish to build a replica of one of their aircraft. You may be lucky and get hold of outline drawings of just the scale you require, but usually there's nothing for it but to get out the dividers and start scaling up. Magazine three-views are another source of data and M.A.N. plans by Wylam, Wieczorek, Nieto and others are well known for their accuracy and detail. It's become something of a convention to work to a standard scale like 3/4" or 1" to the foot, but there is really no need to do this. Instead, decide on a wing area (including the center section of high-wing types, in your calculations) to suit your particular motor and aim at a span that ties in with this figure. If your pocket book can stand it, the quickest method of obtaining the required outline is by having your small scale plan enlarged photostatically. A cheaper way is to pin a sheet of drawing paper to the wall and project your plan on to it with the aid of a school epidiascope. Adjust to get the required overall dimensions, then sketch in the outline in pencil. Many of the existing rubber powered kits can be adapted to AA power by modifying the nose structure and beefing up the material sizes. Full size side views of motors—as supplied by some manufacturers and in the magazines from time to time—are useful when planning the powerplant installation in a new model.

After the outline drawings (side, top and front) have been completed, pencil in the thrust line and the angular setting of the flying surfaces—in the side view. We standardize on plus 2° for the wing and minus 1° for the stabilizer, confining all trim adjustments to the latter and the thrust line. Slightly thinned Clark Y is suitable for the wing (about 11 per cent and the stabilizer may be of similar section, but thinned to about 7 per cent. Wing area



Readers with a yen for designing their own flying scale gassies will find plenty of useful information in this drawing of one of author's designs.

depends directly on the type of flying you are interested in, and the following wing area/power combinations provide a guide in this direction.

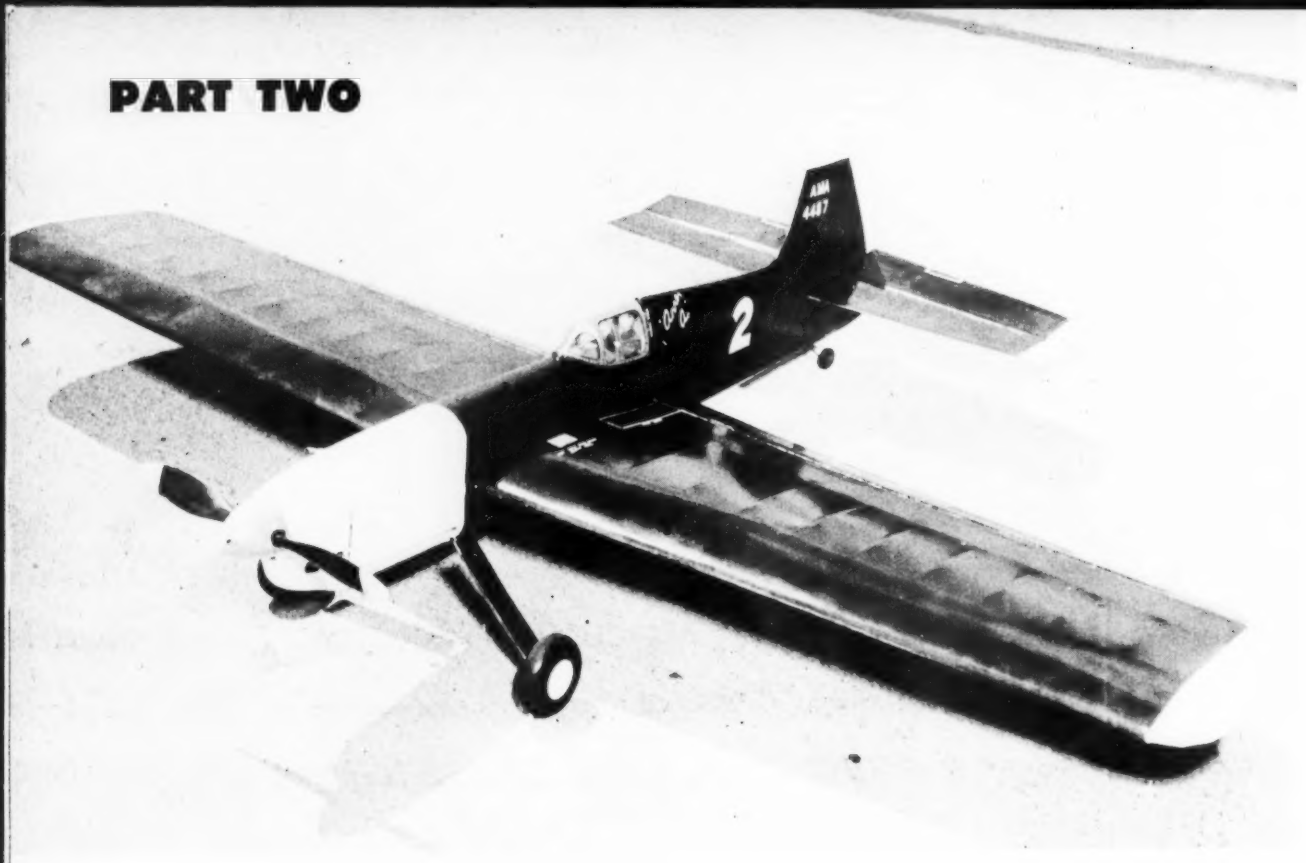
Motor	Sport Flying	Contest Flying
Infant .02	130 sq. in.	105 sq. in.
Torpedo .035	170 sq. in.	140 sq. in.
O.K. *Cub* .039	180 sq. in.	150 sq. in.
Baby Spitfire .045 *Spitzy* .045	205 sq. in.	165 sq. in.
Torpedo .049 *Baby-Mac* .049 *Wasp* .049 O.K. *Cub*	220 sq. in.	180 sq. in.

When enlarging tail surfaces (for stability), be sure to retain the characteristic outlines of the original. If desired, part of the extra fin area may be added in the form of a celluloid tab, which will be almost invisible in flight. Rib spacings should be about 2" and former spacings 2-1/4" at the most. When the former stations have been determined, draw the two sections at the leading and trailing edges of the wing, working from the front view and photographs of the full size aircraft. Plot the remaining front and rear formers over these sections, first marking off the maximum width and depth of each. When these sections are completed, trace each one separately and draw in the cut-outs and notches.

We favor building contest type models and controlling the power output in the testing stages by fitting a low pitch prop—or by slackening off the compression lever in the case of a diesel. Then, when we have the trim adjusted and the flying surfaces well keyed in, we can open up the motor and enjoy the thrill of seeing a scale job that climbs almost as fast as the pylons. We followed this practice with a 174 sq. in. Cessna *170* and a 178 sq. in. Luscombe *Silvaire 8-A;* both are powered with .034 *Dart* diesels. As a wing area of 200 sq. in. is considered normal for a pylon design fitted with a *Dart* (and 250 sq. in. for a sport model), you can imagine that under full power these babies behave like a V2. Although models of this type need more than the usual care during the trimming stages, we have yet to wind one in under power, as we usually log something like 20 flights before opening up the motor. Low pitch props are useful for reducing the natural left turn (with torque) of a cabin model and we have found that up to three degrees of right side-thrust are also needed to hold off that left turn at maximum revs.

Judging from the designs that have appeared in your model mags since K & B first unveiled their *Infant*, most American scale free flights appear to be made all-of-a-piece, just like a control-liner. We feel that the life of such a model must be relatively short, as compared with the typical British design, which features detachable flying surfaces and struts, for easy transportation and safety in crashes. Plug-in wings have proved virtually crash-proof in practice, but this type is a little tricky to install accurately and we personally favor a one-piece wing resting on top of the fuselage, like any other cabin power model. Various wing construction snags (such as including part of the windshield or fairings) have to be overcome, and the accompanying sketches and photos show how this is achieved in the case of our models. Wings are retained by internal bands to preserve (*Continued on page* 47)

PART TWO



Stunting CAN BE Smooth

by GEORGE ALDRICH

Plans and directions for building the Nobler, outstanding stunt job that placed high at the Nats and won Plymouth finals.

▸ Take two sheets of sinewy grained 1/8" sheet balsa and cut them to proper length. Cut inside bracer pieces of same type of stock. Firewalls are 1/8" plywood. Pin bracers onto inside of the sides and mark position of the motor mounts on bracers. Cut out the portion that motor mounts would ordinarily be cemented to. The mounts should now be cemented in place. (Full proof cement is recommended.) Make sure they are in proper position and cement all bracer pieces in place except those that fit in front of forward firewall. Drill holes that are to take "J" bolts into second firewall. Bend landing gear to shape; mount it on firewall. Cement firewalls into slots in bracers and place unit in clamps or vise to hold alignment until dry. Add 1/8" square piece at rear of fuselage.

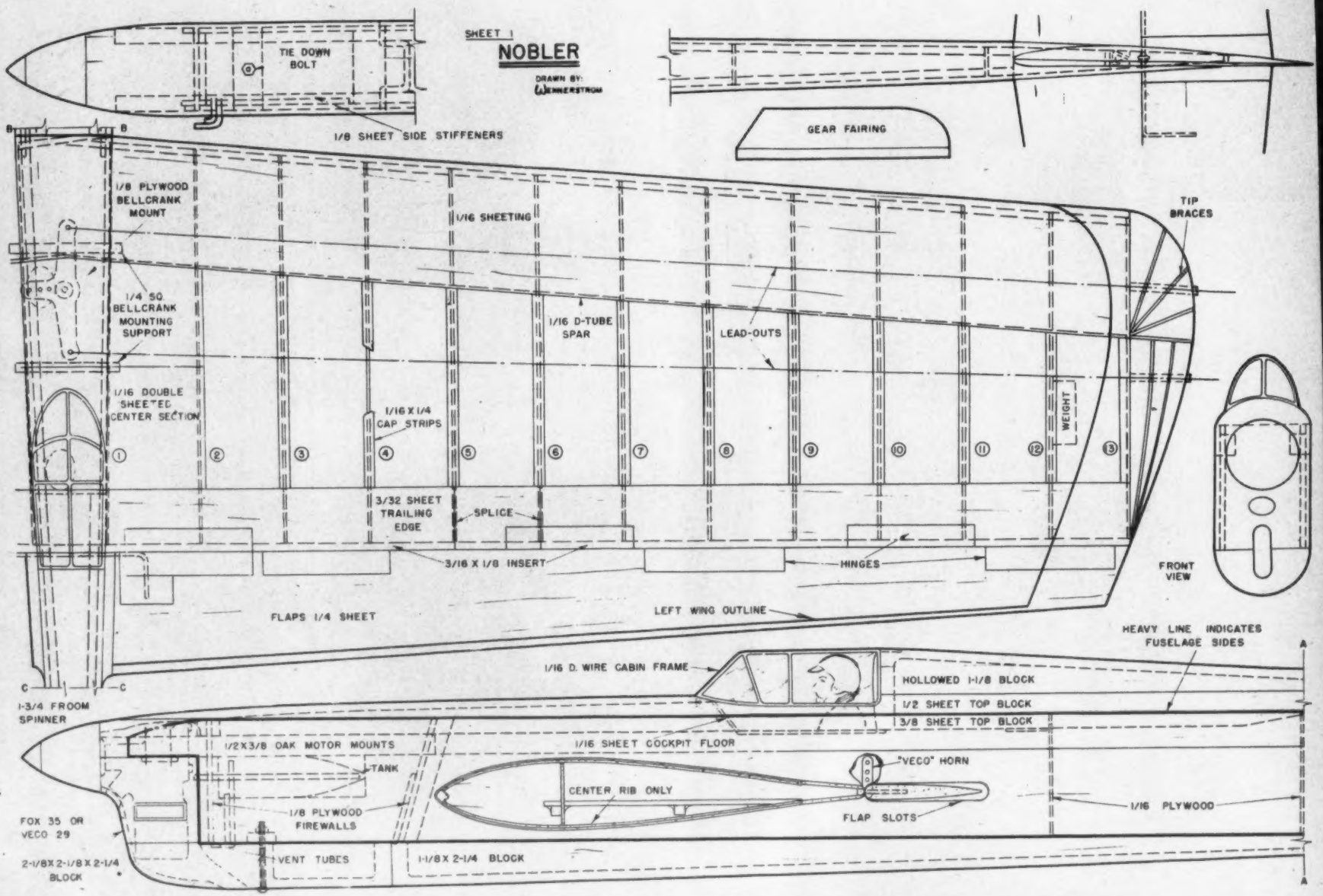
Start wing construction. Notice that center four ribs are double covered with 1/16" sheet behind 3" leading edge sheeting. These four ribs must be recessed 1/16" more top and bottom than the others.

Number one rib outline is shown on side view of fuselage. Recessing on number two rib is not shown for clarity. Cut remaining ribs and sand smooth. Make notches in ribs, being careful to cut them in an every other one sequence. The position for all notches in the ribs is shown on end or number 13 rib.

Select a very hard piece of 1/16" sheet balsa for D-tube spar. Put sections together and cut spar to shape. Slip ribs on spar but do not cement. Take two sheets of medium grade 3/32" x 3" x 36" sheet and cut it down center so that you have four pieces 1-1/2" x 36". Mark the rib position on these pieces, remembering that one length runs through center and is spliced out in middle of each panel.

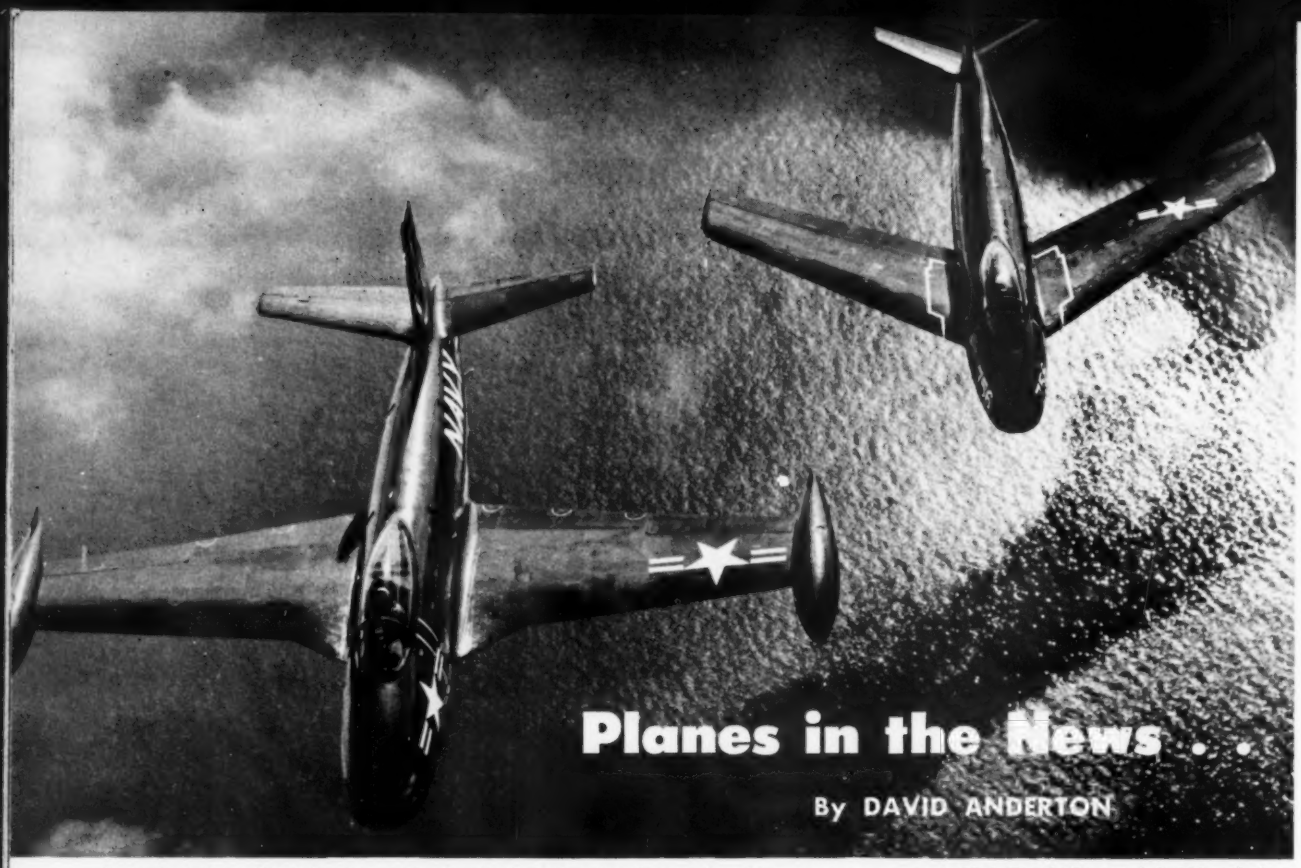
Remove two number one ribs and cut 1/4" square holes to take bellcrank mount supports. Cut 1/4" square supports and have ready for assembly. You must now work very quickly. Pin the 3/32" trailing edge pieces on the board, cementing the splice as you do so. Put a line of cement on each rib end and lay panels down on trailing edge as you slide the 1/4" square pieces in place and cement. Pin and cement each rib in position on marked places. Cement two spar ends together, double coating several times with cement. Each rib should be cemented in place now where they form a cross-lap joint on spar. Be sure to block up the tips to allow for wing taper.

The fuselage should be dry by now. Cut 1/16" sheet balsa horizontal braces and cement in place. These serve only as supports until 1/16" plywood formers are put in place later. Blocks, both top and bottom, are of soft quality. Cement together and clamp 3/8" x 2" x 36", the 1/2" x 2-1/4" x 36" and 1-1/8" x 1-5/8" x 15" blocks and set aside to dry. Mark and cut off at 90 degree angle portion of the 1-1/8" x 2-1/4" x 36" block that will be used as removable cowl. Spot cement block in place and cut roughly to shape. Finish rear part of carving and sand roughly. Remove this portion and hollow out to approximately 1/4" wall thickness and sand. Start on top block. In 3/8" x 2" x 36" block, cut a 1/8" groove 2-9/16" back of spinner line, 3/8" deep. This is for Fox only. Measure for different engine. As 2" wide block is centered on 2-1/4" block, you have 1/8" overhang, which makes a flush arrangement when top piece is set in place. Spot cement top block in place and carve to rough shape. Cut off excess wood, which (*Continued on page* 38)



FULL SIZE PLANS OF "THE NOBLER" AND "THE FUNSTER" AVAILABLE. SEE PAGE 51.

Additional plans for building the Nobler will be found on page 38.

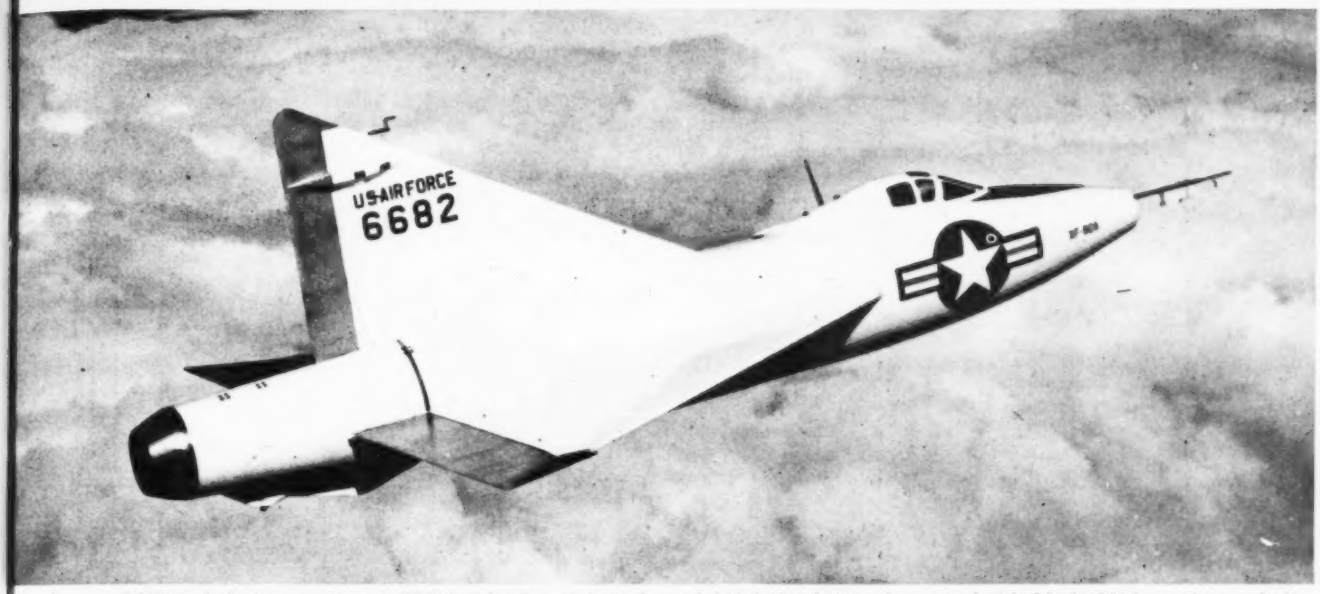


Planes in the News . . .

By DAVID ANDERTON

Basically similar to AF's *Sabre*, Navy's *FJ-2 Fury* by North American features four 20 mm cannon armament. GE *J-47* turbo-jet puts it is 650 mph class.

Piasecki *HUP-2* 'copter, left, a utility shipboard model, is first production design to have automatic pilot. Later mods for anti-submarine work. Payoff on daring development by Navy, Vought, is the production *F7U-3 Cutlass*. Twin Westinghouse jets give about 12,000 pounds static thrust.



Addition of afterburner to Convair *XF-92A* adds substantially to thrust of *J-33-A-29* turbojet and to general wicked look of high speed research ship.

Soon to see service is a trio of new Navy fighters, Vought's new F7U-3 Cutlass hogging the spotlight. Meanwhile, without fanfare, light plane builders have ideas of their own

▸ At the time of writing the outcome of the fighting in Korea is still being thrashed out verbally in the tent city of Panmunjom. And in spite of this stalemate, we are learning much about the political and military ways of totalitarian states. And we've learned a lot about the bloody art of warfare.

We've learned enough about air power—in certain forms—to start changes in production lines for fighters and light bombers. We've learned that some of our weapons concepts were pretty antiquated. We've learned that a pilot hit in the head with a .50-cal. bullet is as dead as one hit with a 20-mm. cannon shell. And most of all, we've learned that the airplane, in all its forms, is one of the most versatile weapons and aids to war that was ever devised by man.

The proof? Air power, in one form or another, has kept the outnumbered and outsupplied U.N. forces on the peninsula, and has helped them punch deep holes into the Red perimeter.

Certainly one of the most outstanding articles on the lessons of the Korean air war appeared in AVIATION WEEK for March 10. It was written by A. W. Jessup, who must hold some sort of a record for coverage of the campaign, because he's been reporting from Korea since the fracas began.

He says that the big lesson is that air power "will be the decisive factor in battle against either modern mechanized armies or superior numerical forces. . . ."

Jessup goes on to underscore the fact that air power—in the big, strategic sense—was through after the first few weeks in Korea. Through, because there were no more targets in North Korea for pulverizing. The war settled down to a nasty ground struggle, with tactical air coming to the fore. And there, says Jessup, is where we are learning something new every day.

Sample lessons:

▸ We've got to stop building airplanes which are so safe that they are a combat liability. In other words, the safety features for peacetime flying become service hazards because of added weight and complexity. *Sabre* pilots feel that over a ton of equipment could be removed from the F-86.

▸ The MiG, for all its reputed lightness and simplicity, is one fine airplane. Jessup says that a film strip from a *Sabre* gun camera shows a MiG pulling away, making two rolls and a split-S while accelerating away from the F-86. And the *Sabre* was right on the airspeed redline—Mach limit—at the time.

▸ Complete air superiority is out, for a while. There is a parallel here to the days of World War II, when the British and U. S. forces completely dominated the air. Even so, German (*Continued on page* 53)

Dramatic ground shot of *F7U-3* shows repositioning of the guns above the intakes.

Grumman *Cougars* came off line within five months, after first hop.

Lud shows off one of his hornetlike "flea flights." Power is controlled by the use of severe left-thrust and downthrust Below—This *Infant* powered job climbs with the best of them.

the funster

by LUD KADING

This tiny and novel free flight has wowed the boys at last two Nationals with its breath taking performance under power. Build, fly one for fun.

▸ Here is a small model to give you all the thrills and fun of a contest type pylon model with a minimum of effort.

The *Funster* will give you a terrific rolling climb with a fast but very flat glide. The average glide is usually only two to two and a half minutes on approximately 20 seconds of engine run; however, many flights of ten minutes have been made.

This vest pocket model is the development of about two years of trial and error of various types and designs, to a stable and highly responsive type of aircraft. The climb for its size is fast; when properly adjusted it will shoot up at about 2,000 feet per minute, and will give some of its big brothers a good run for their money.

Being so small you would expect the *Funster* to be tricky to fly, due to wind and other evils. This is not so as it will hold its own in a wind with most any size model. Because of its fast climb it seems to cut through the wind like a knife.

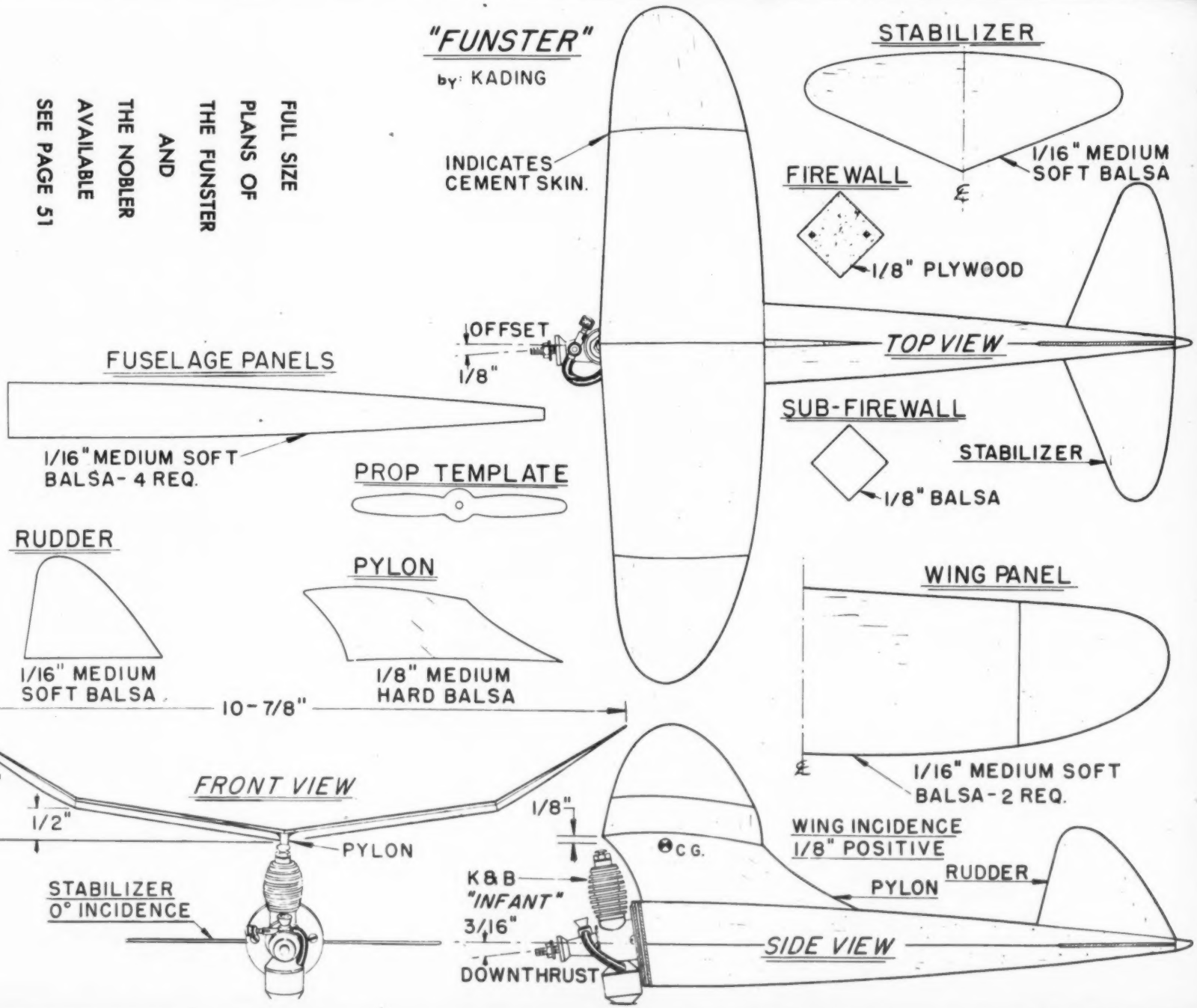
Construction is simple. First is the wing. Cut two panels from medium soft 1/16" balsa sheet. Sand lightly top and bottom surfaces with 200 to 280 sandpaper and round leading and trailing edges. It is not necessary to sand in an airfoil as usually done for solid wing construction as the slight underchamber will take care of this. Wet the top half of the wing panels only and, when the wing reaches approximately 1/8" off the table, pin in four places until dry.

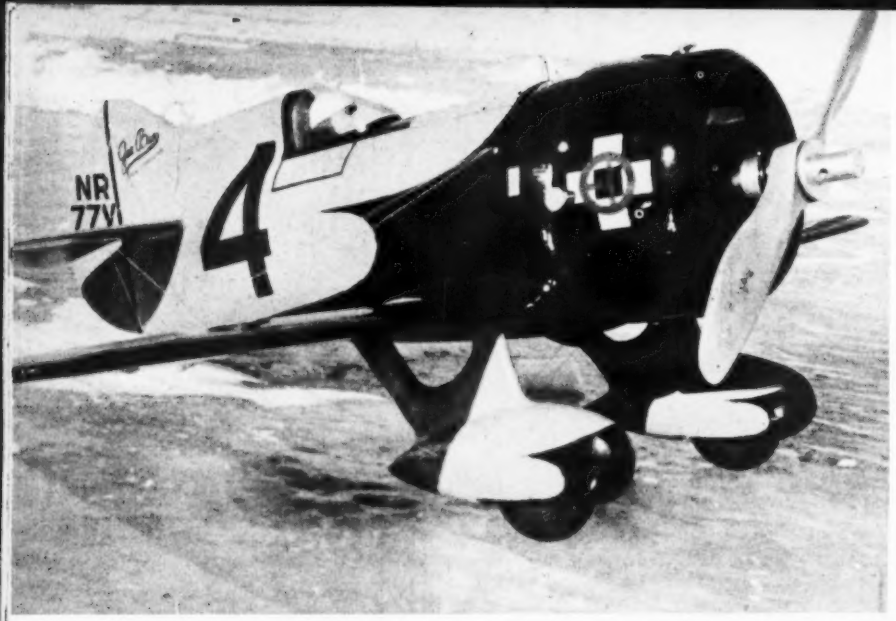
If there is a large electric roll ironer in the house, the job of undercambering the wing is easily done by soaking the wing panels in water, then rolling them through the ironer at about the same temperature used to iron silk or rayon. The wing will come out dry and undercamber set ready to use. Next cut the two tip panels as shown and fit for polyhedral. Pin inside panels flat to table and cement on tips, raising them 1-1/4" off the table. Set the wings tip to tip; this will assure both sides being equal. Join the two halves together raising each one a 1/2" at the polyhedral break and cement well *all joints.*

Cut four fuselage sides, using pattern and carbon paper to trace with. Pin all four pieces together and sand equally. Sand edges at a 45 degree angle to assure a good fit. Spot cement the four small ends together and wrap with a small rubber band. Now cement balance of all four sides and work into place, wrapping with rubber bands about every inch. Cut and insert sub-firewall, set in with 3/16" downthrust and 1/8" left-thrust. As fuselage is drying, cut remaining pieces to shape and sand lightly. Rudder and stabilizer need only to be sanded (*Continued on page* 43)

FULL SIZE PLANS OF "THE NOBLER" AND "THE FUNSTER" AVAILABLE. SEE PAGE 51.

FULL SIZE PLANS OF THE FUNSTER AND THE NOBLER AVAILABLE SEE PAGE 51

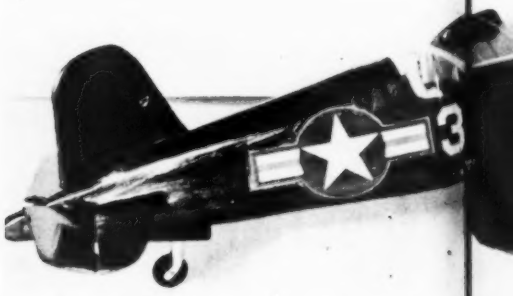




Terrific GB *Sportster* from M.A.N. plans takes first place prize for workmanship ($10). Work of W. P. Sansom, Montreal, it is scaled down 5/6 size and powered with ED 2.46 diesel.

Hi Johnson, Tommy Protheroe, with their 950 sq. in. towline gliders, named *Don Yonda*.

Second prize subscription winner, cute Curtiss *JN-4D*, H. Kelley, Sierra Madre, Calif. In one inch scale, spans 37-1/2 inch, has .045 *Baby Spit*. It is a good flier, features knock-off wings.

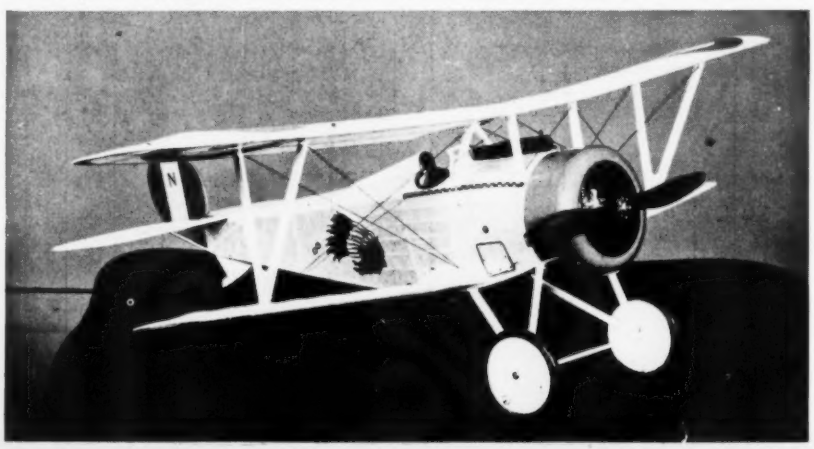


Another conversion of Monogram *Speedee Bilt* to u-control is Vought *Corsair* with *Wasp*. Below—Vic King, Pharos Club, Britain, with his scale, 38 inch, Mills 75. Ship is *F.E.8*.

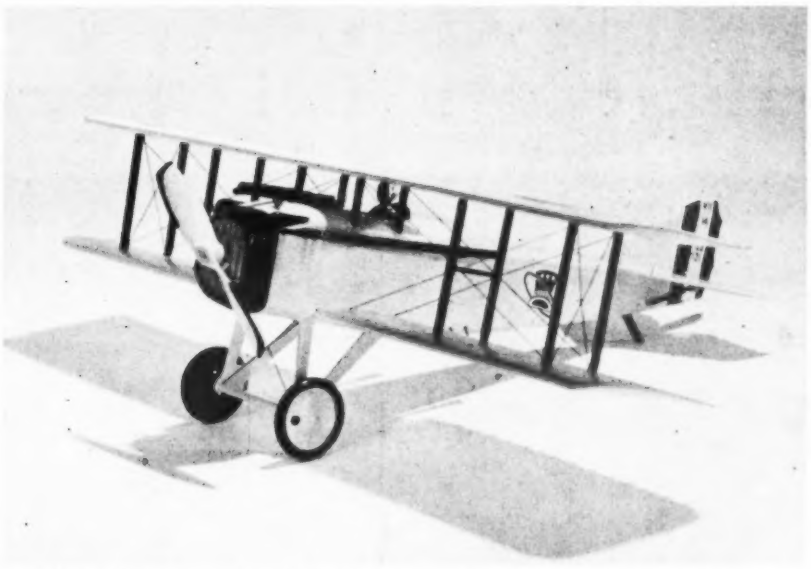
air ways

Here we go again! Ingenuity runs rampant, as M.A.N. readers turn out usual batch of nifties.

Third place subscription winner, Nieuport 17, 1/4 scale, .035, Cliff Potts, Waterloo, Iowa.



Pix taken by Cedric Galloway. Rumor has it these gliders are for radio control kits.



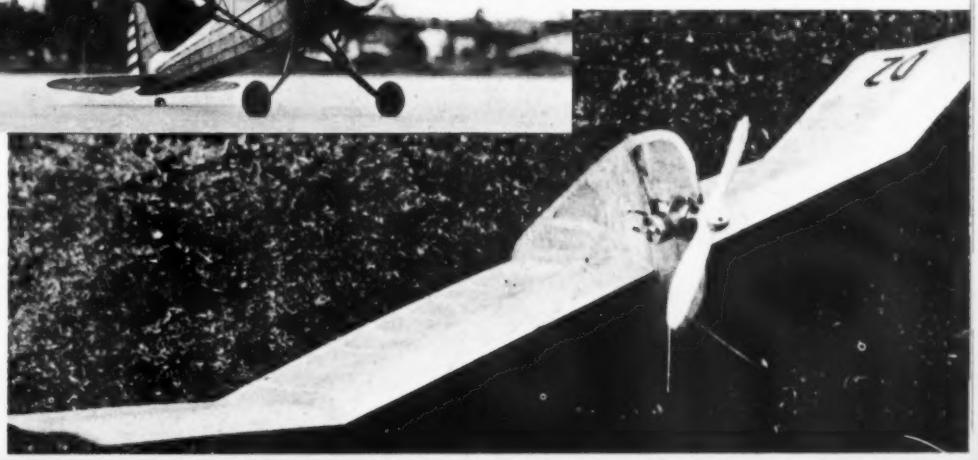
What looks like still another *Speedee Bilt* is neat French *Spad*, built by Fred Seales, Farmington, Maine. Note scalloped trailing edges, scale pilot, and the enhancing decals.

By Robbert Mills, Saugus, Mass., it is planked. Complete to guns and radome on wingtip.

It was cold and the wind was blowing, said Fred Ulrich, Boise, Idaho, who snapped this pic of Gerry Brogstedt, himself center, and Max Blodgett, right. Free flights, payloads.

Carefully rendered Stinson *0-49* by Roy Mootoo, Port of Spain, Trinidad. Has swiveling tail wheel, shock absorbing landing gear, detachable wings. Flies.

An E. D. powered flying plank, G. Drew, of Ireland. It is a tractor, see.



Youthful test pilots who served as guinea pigs have no trouble firing up the Ohlsson & Rice.

we test

TRIXTER PROFILE TRAINER

When, in U-control, you hear the word trainer, one immediately thinks of a profile fuselage, all wood construction, ordinary flying ability. Guillow's *Trixter Profile Trainer* adds no radical improvement to the traditional trainer formula but it does prove that the formula can be further refined and, in doing so, reveals an approach to flying characteristics that is a bit different from that of other trainers. This, perhaps, is the result of stunt-man Lew Andrews' natural reluctance to limit a trainer to round-and-round flying.

Gay looking test job at left also shows fair sized elevators which added zip and made loops easier.

Attaching the leads for counterclockwise flying. Designed for clockwise flying, the ship may be prepared to fly in either direction.

On both box and plan, between the words Profile and Trainer, is another smaller word: "Basic." Therein, lies the story. For, as will be recalled, pilot training was once divided into primary, basic, and advanced. If, however, basic means that a design is a notch above primary, the *Trixter Profile Trainer* should be described in its flying, as primarily basic but, in its construction, as basically primary. It is capable of loops, yet can be put together quickly by any boy who is old enough to drill four mounting holes for the engine bolts, actually the hardest part of assembly!

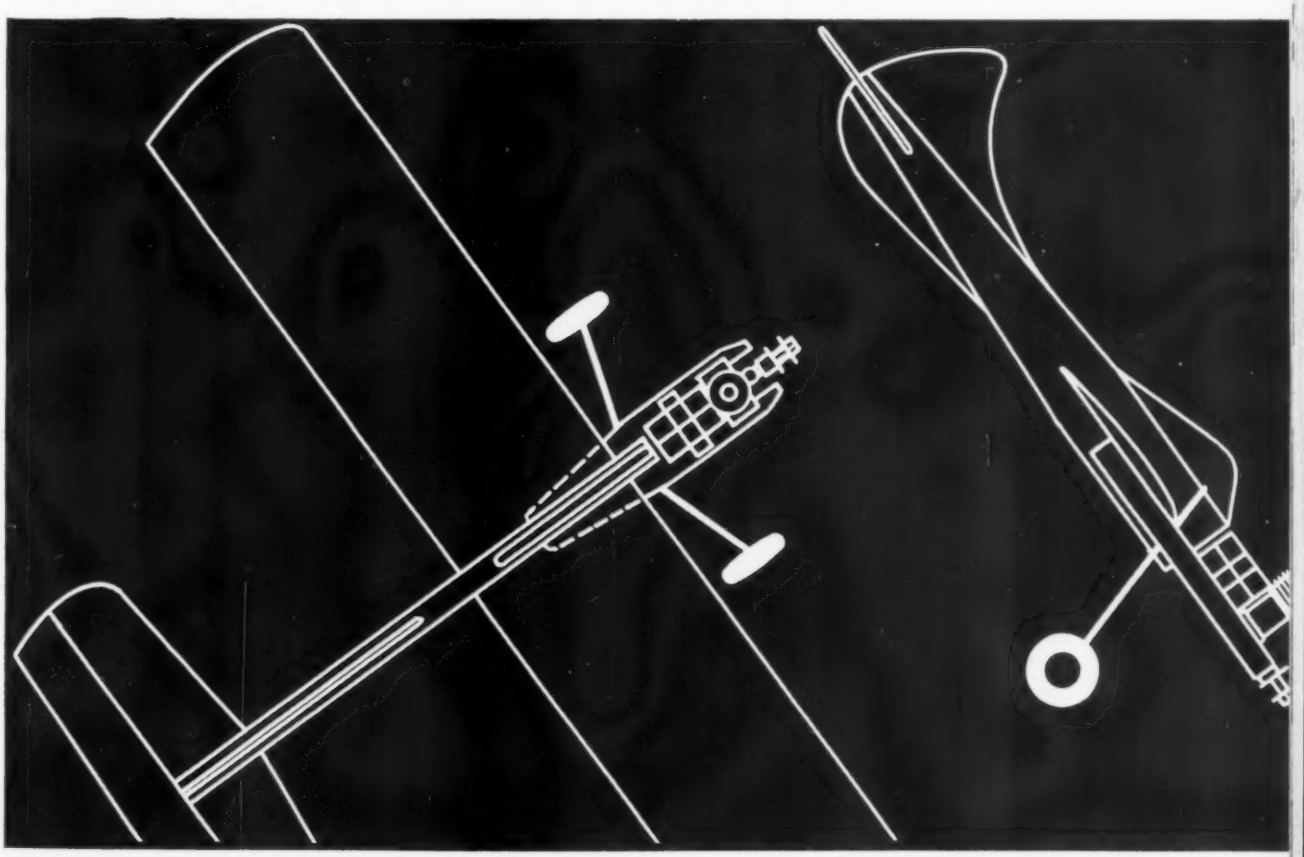
It will help in describing contents of the box to say that Lew Andrews has a talent for interlocking parts, as everyone knows from the Profile *Trixter* stunt job which preceeded the *Barnstormer*. The fuselage from just forward of the wing to the tail is a profile cut and shaped piece of hard balsa, amply thick to withstand any crack-up, and slotted for both the vertical and horizontal tails, and cut out for the wing. The short forward section of the fuselage is a harder wood, also notched to slide over the wing; the rear section has a vertical slot in its front end, and the forward section has a corresponding tongue. Both slide together and clamp the one-piece fully shaped wing in position. This is done as quickly as it is said. The formed landing gear slips over this front section, being countersunk in a special groove already cut in the hard wood, and then the hardwood motor mount, slotted to slide over the fuselage from the front, really clamps everything in place. There is nothing to say about construction as it is virtually automatic. Materials are good, prefabrication high grade, and all hardware is supplied.

It is Lew's concept of trainer performance that provokes discussion—note that we did not say argument. There are people today who tell you that a boy can learn to fly on a stunt model. This is true, though the risks might be greater or the percentage of success, a shade lower, when the student has benefit of on the spot guidance from a more experience flier. Working together in the center of the circle, the "teacher" will have the student flying level, maybe even taking off and landing in a few flights. Unfortunately, a cracked up stunter is a vastly different proposition from a broken trainer which is often cemented and recemented together many times. Working alone, the boy certainly always should have the profile for his first attempts.

The usual approach from here on in is to limit all control movements and areas for mild reaction. Holding up on take-off is not disastrous and the usual up and down gyrations after take-off are minimized. But in the long run, the boy so trained frequently breaks up his second and more complicated airplane because it reacts more violently; he may even loop into the ground on take-off. The contrast is too great as the novice leaps from the primary to the advanced stage.

The *Trixter Profile Trainer* has approximately 40 per cent of its horizontal tail area in moveable surfaces. In combination with a minimum movement, the ship is on the responsive side, though not overly so. After getting the feel of things, the boy can step up movement by changing bellcrank or horn holes or, later, even both, and have about as lively a flying machine on a 23 as is possible with a trainer's long moment arm and solid construction. In any case he will be less surprised when he goes to a more advanced and responsive airplane.

In preparing the sample *Trixter Profile Trainer* for this report, we elected to make an unusual experiment. The kit was turned over to a 16-year old builder who had attained ability to do mild wingovers and loops of an exceedingly doubtful quality. No guidance of any kind was given except for the tip that the air intake on the front valve 23 had to be plugged to prevent the engine leaning out in the air. An unexpected result was his decision to reverse the direction of flying. The *Trainer* is a clockwise flier. In putting the controls and lead outs on the other side for counterclockwise flying, he failed to recognize the need to reverse the wedge tank with the result that the engine would conk after a lap or two. This was easily corrected since the two (*Continued on page* 52)

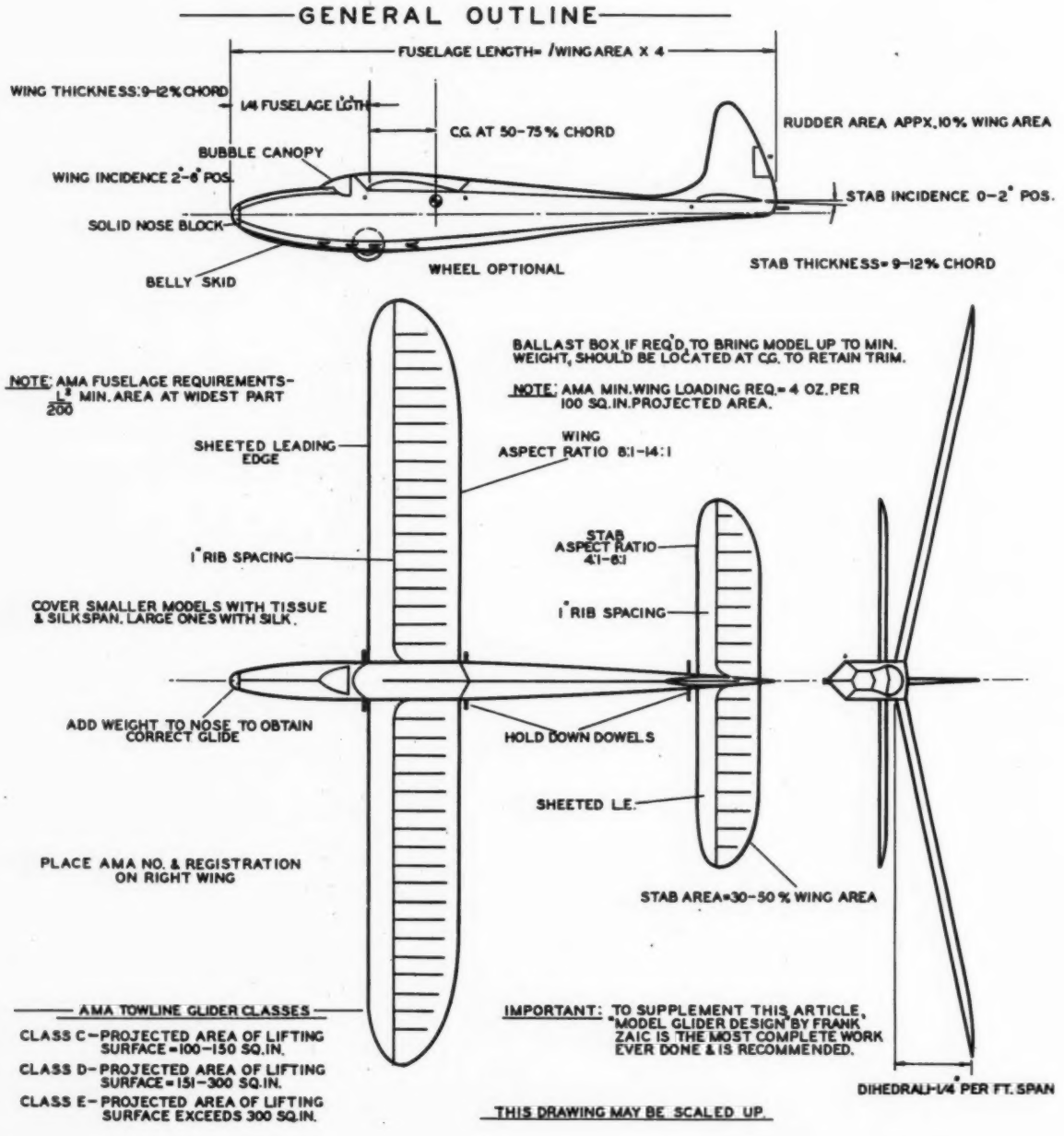


design detail

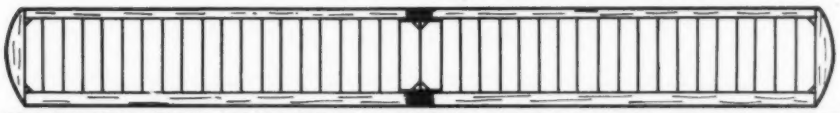
Towline

. . . by Harry Williamson

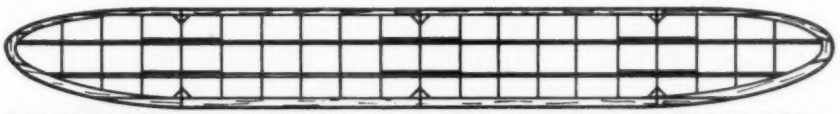
The most beautiful model in flight is the towliner or "sail plane." Simple to build, quiet, clean, it is different. But it takes special kind of know-how.


GENERAL OUTLINE
FUSELAGE LENGTH= √WING AREA X 4
WING THICKNESS: 9-12% CHORD
1/4 FUSELAGE LGTH
CG AT 50-75% CHORD
RUDDER AREA APPX. 10% WING AREA
BUBBLE CANOPY
WING INCIDENCE 2°-6° POS.
STAB INCIDENCE 0-2° POS.
SOLID NOSE BLOCK
WHEEL OPTIONAL
STAB THICKNESS= 9-12% CHORD
BELLY SKID
BALLAST BOX IF REQ'D TO BRING MODEL UP TO MIN. WEIGHT, SHOULD BE LOCATED AT CG. TO RETAIN TRIM.
NOTE: AMA FUSELAGE REQUIREMENTS- L²/200 MIN. AREA AT WIDEST PART
NOTE: AMA MIN. WING LOADING REQ.= 4 OZ. PER 100 SQ. IN. PROJECTED AREA.
SHEETED LEADING EDGE
WING ASPECT RATIO 8:1-14:1
STAB ASPECT RATIO 4:1-6:1
1" RIB SPACING
1" RIB SPACING
COVER SMALLER MODELS WITH TISSUE & SILK SPAN. LARGE ONES WITH SILK.
ADD WEIGHT TO NOSE TO OBTAIN CORRECT GLIDE
HOLD DOWN DOWELS
SHEETED L.E.
PLACE AMA NO. & REGISTRATION ON RIGHT WING
STAB AREA=30-50% WING AREA
AMA TOWLINE GLIDER CLASSES
CLASS C- PROJECTED AREA OF LIFTING SURFACE = 100-150 SQ. IN.
CLASS D- PROJECTED AREA OF LIFTING SURFACE = 151-300 SQ. IN.
CLASS E- PROJECTED AREA OF LIFTING SURFACE EXCEEDS 300 SQ. IN.
IMPORTANT: TO SUPPLEMENT THIS ARTICLE, "MODEL GLIDER DESIGN" BY FRANK ZAIC IS THE MOST COMPLETE WORK EVER DONE & IS RECOMMENDED.
DIHEDRAL- 1/4" PER FT. SPAN
THIS DRAWING MAY BE SCALED UP.
SCALE RULER
0
2
3 FEET

MISCELLANEOUS DETAILS

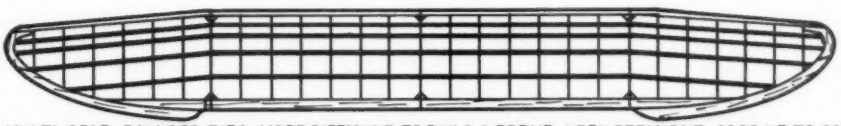


SPARLESS-HEAVY LEADING & TRAILING EDGES-SOLID TIPS-PLY GUSSETS AT DIHEDRAL BREAK-GOOD UP TO 200 SQ.

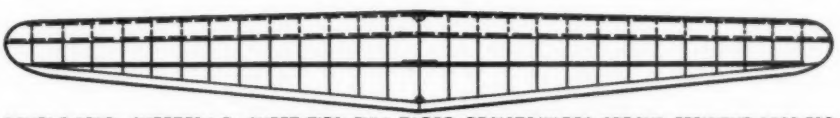


DOUBLE-SPAR-ROUNDED TIPS-WARPS EASILY-LIGHT & STRONG-EASILY BUILT-REINFORCE ALL BREAKS.

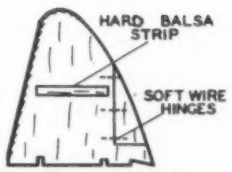
SINGLE-SPAR-TAPERED TIPS-NOT VERY STRONG-EASILY BUILT BUT INEFFICIENT-NOT RECOMMENDED.



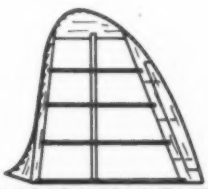
MULTI-SPAR-ROUNDED TIPS-MORE DIFFICULT TO BUILD & REPAIR-VERY EFFICIENT-GOOD UP TO 200 SQ.



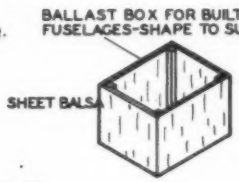
DOUBLE-SPAR—SHEETED L.E.-SHEET TIPS-FULL TAPER-RESISTS WARPS-STRONG-EFFICIENT-GOOD FOR ALL SIZES.

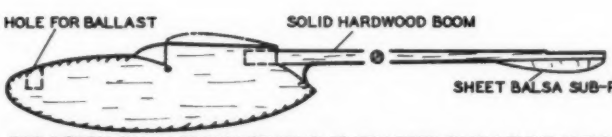


MED HARD SHEET BALSA-MAY BE NOTCHED FOR STAB.

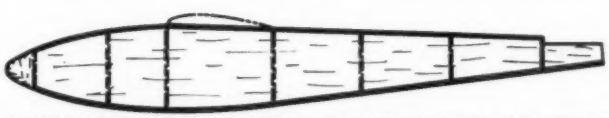


BUILT-UP TYPE, LIGHT & STRONG



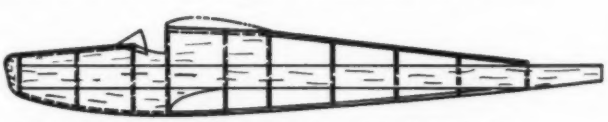


POD & BOOM-BALSA POD MAY BE SOLID OR HOLLOWED-EASILY BUILT-CLEAN.



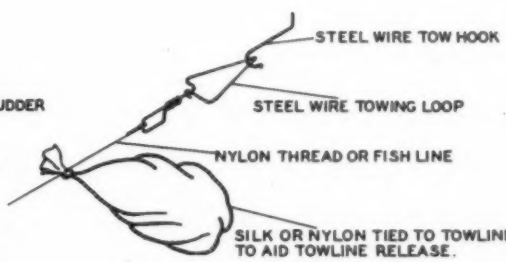
SHEET BALSA BOX-EASILY BUILT LIGHT & STRONG-GOOD FOR BEGINNERS

BUILT-UP TYPE-MORE DIFFICULT TO BUILD-LIGHT AND STRONG.

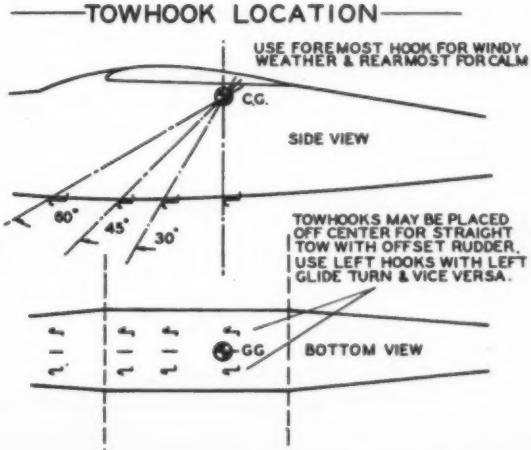


SHEET CRUTCH & FORMER-STRONG, LIGHT-RECOMMENDED

NOTE: BASIC FUSELAGE TYPES ARE THE MOST COMMON AND MOST PRACTICAL. WIDE VARIATIONS OF BASIC TYPES TO SUIT SPECIFIC DESIGNS.



TOWHOOK LOCATION


USE FOREMOST HOOK FOR WINDY WEATHER & REARMOST FOR CALM
C.G.
SIDE VIEW
60°
45°
30°
TOWHOOKS MAY BE PLACED OFF CENTER FOR STRAIGHT TOW WITH OFFSET RUDDER. USE LEFT HOOKS WITH LEFT GLIDE TURN & VICE VERSA.
GG
BOTTOM VIEW

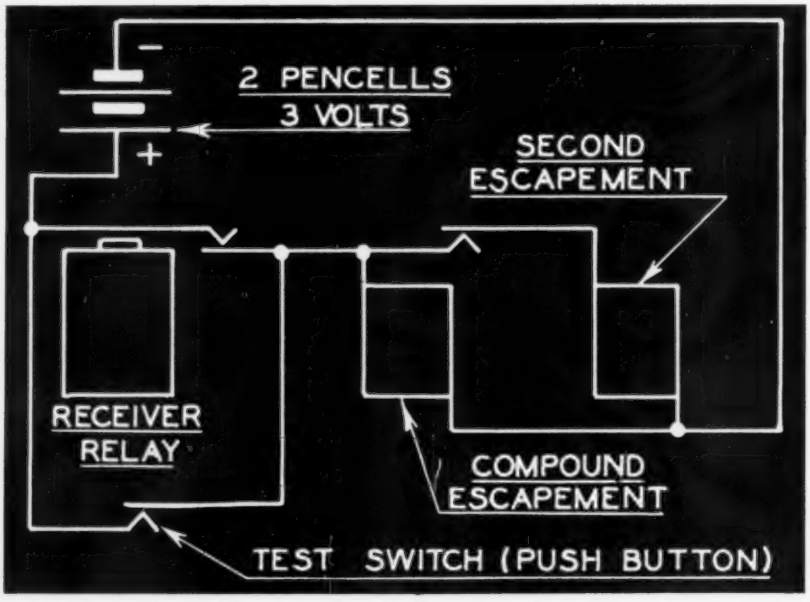
A *Rudder Bug* gets away. With the compound escapement power approaches, loops are possible.

for the R. C. fan

compound escapements

by HOWARD BONNER and HERB OWBRIDGE

Still using a single channel, the operator now can get left or right rudder and motor or elevator without having to follow a sequence. Either rudder position can be repeated as desired.



▸ Because of its simplicity, low weight and cost, the escapement has always been the most popular device for moving the controls of a radio-controlled model. But it has always had the disadvantage of being a sequence control. Going through right rudder to get left rudder is all right because it can be done quicker than the model can respond. But when other controls are added (such as engine or elevator control) separation is a must. That is, one should not have to disturb the engine or elevator setting just to change the rudder position. Other types of controls have natural separation. Walker's control separates different signal lengths, Trammell's control separates signal rhythms and Rockwood's control separates signal tones. Now, by means of a very simple and reliable device that has been with us for years, just waiting to be used, we have an escapement that can recognize and separate the count of one, two or three signals. Since the operator no longer has to keep a mental record of which rudder comes next and, since he can operate the rudder without disturbing the setting of the motor control, the intelligence level of the common escapement has been brought up to very near that of the more complex controls. As far as proportional control is concerned, the compound escapement comes about as close as other control types since either rudder position can

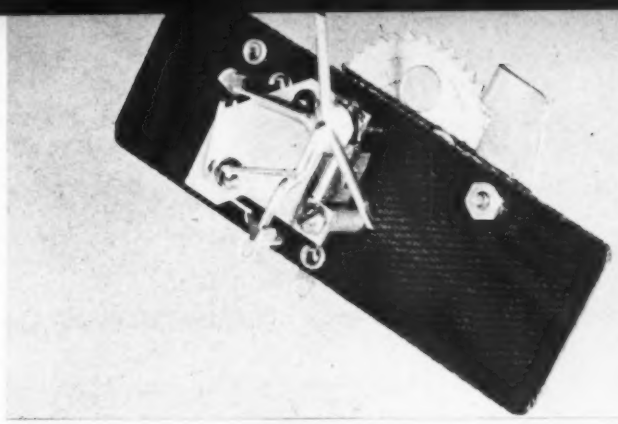
be repeated as often as desired without the fear of skipping a control and getting out of synchronization.

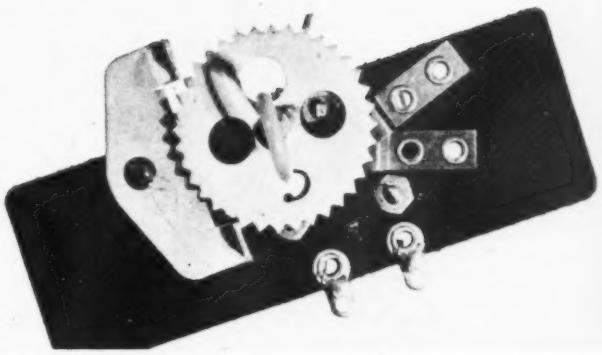
Like the escapement in the article "Exit the Beep Box" (September 1951 M.A.N.) this escapement has only one neutral position. This is no minor detail but a major step toward reducing the mental effort required by the operator. But (to resort to phonetics) instead of going "click," this escapement goes "bzzzt." That is, instead of operating with a mouse trap action that requires accurate timing at the transmitter to stop it at the right place, it has a very simple speed reducer so that timing is no problem, and the ordinary push button at the transmitter is good enough. The speed reducer is very common but if it has a name, we don't know it. So we call it a resonant-inertia escapement. If it ever had an inventor we are grateful to him for it has everything we need. It is cheap, light, easy to make and is so reliable that it will operate down to the last knot in 1/8" rubber band. Also its speed is uniform over a wide range or rubber band torque and there is no wear or adjustment problem. What more could we ask? It is only natural that new ideas should obsolete old ideas so all production of Ruddevators and related controls has been discontinued. The original compound escapement was turned over to Howard Bonner not only for flight testing but also for simplification of the design down to the production model shown here.

Figure 1 is a front view showing the escapement in the one and only neutral position. Only the joggled bar, with the crank soldered to it, can touch this neutral or de-energized armature stop. The other three bars hit the energized armature stop only when the electro-magnet is energized by a signal from the transmitter. The rubber band is wound right hand so it turns the bars counter-clockwise in this view. On the first signal, the neutral (lower) stop will release and the energized stop (upper left) will catch the uppermost bar. This could be left or right rudder. Since we rig the torque shaft bearing (which goes back to the rudder) 13/16" above the escapement shaft (an optimum position) this first signal gives right rudder. The next bar gives left rudder and the last bar (which stops the rudder very close to neutral position) is related to motor control which we will explain later. Notice that Bonner has made the angle between the energized stop and the first bar small. But the angles between the first bar and the second bar, and the second bar and the third bar are large and equal. This is to get the time from right rudder to left rudder and from left rudder to motor control as long and as equal as possible. Actually this is just a production refinement.

Figure 2 shows the star wheel and rocker bar at the rear of the escapement. This is the resonant-inertia escapement. Its speed is determined by three factors. Number of teeth in the star wheel, tooth depth (or stroke of the rocker bar) and weight (or inertia) of the rocker bar. This star wheel has 36-90 degree teeth in a one inch diameter steel disc. With the steel rocker bar shown, it makes about one revolution in 3/4 second. The teeth don't have to be even but it helps. Use a square file and if it comes out too fast, add solder to the ends of the rocker bar to slow it down. This speed was chosen to suit the following: fast enough so the ship would not respond when the rudder cycled through the unwanted position (this was easy) and also fast enough so that it is vertually impossible to send an extra signal too soon and catch the wrong control. Then, slow enough so that there is plenty of time to release the transmitter button and push it again to catch left rudder or motor control. At an escapement speed of one revolution in from ¾ to one second, the whole thing comes out to be a very natural one, two, three operation. One signal always gets you right rudder, two signals always gets you left rudder and three signals always gets motor speed change. You hold the rudder as long as you need. Release and it goes neutral. If you hold the third signal for three or four seconds, you get motor cut-off, which we will now explain.

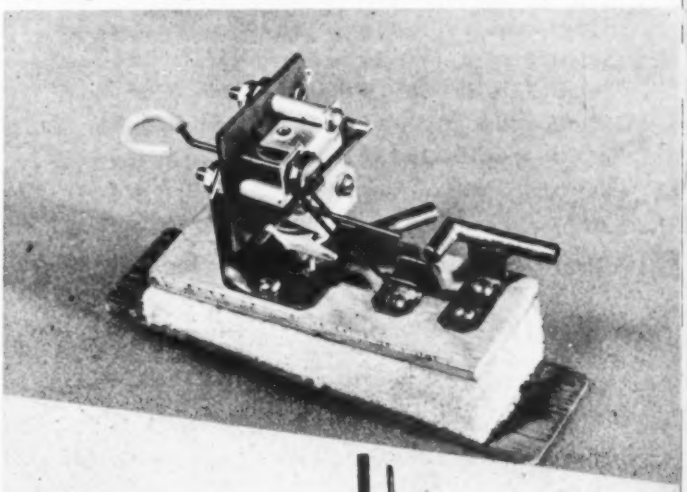
In figure 2, to the right of the star wheel, can be seen part of the two leaves of a switch which is closed by a tab in the star wheel only when the motor control bar is at the energized armature stop. This switch gets its voltage from the receiver relay just as the (*Continued on page 44*)

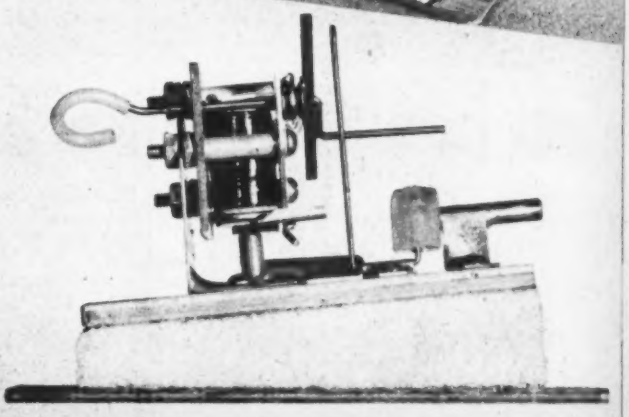




Top—Fig. 1 (front) showing escapement in one and only neutral. Above—Fig. 2 (rear) star wheel which limits speed to one rev in 3/4 sec.

Below—Fig. 3. Bonner escapement for two-speed motor and cut-off. Bottom—Fig. 4. Showing second air bleed valve operating same escapement.





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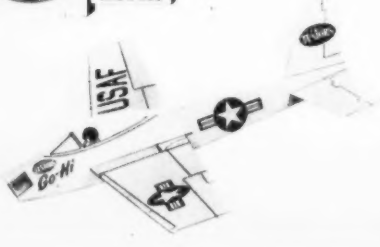

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SENIOR . . . "9" . . . "19" . . . "29"*

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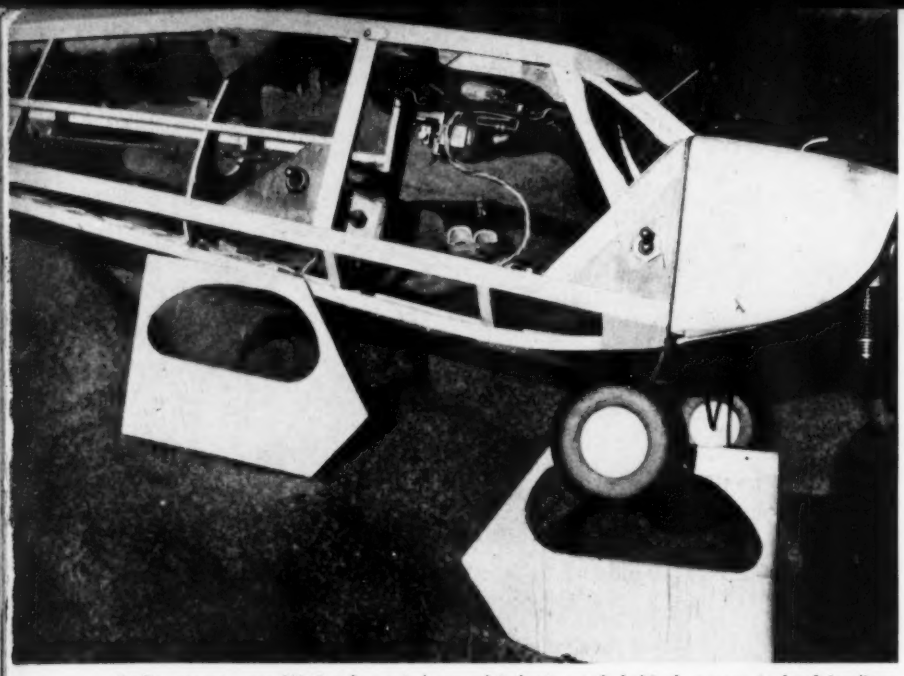
*For the McCOY "9", "19", and "29" engines, the Testor-McCOY "9", "19", and "29" propellers, and Testors "39" fuel.



Radio, shown, uses RK-61 tube, spiral wound induction coil; holds frequency in hard landings.

Only two formers used and one of these is mounting

the C.Q.

R. C. JOB extraordinary

by E. J. Brown

Author's model has faired well at tough coast contests.

This picture taken on first test hop. Walker

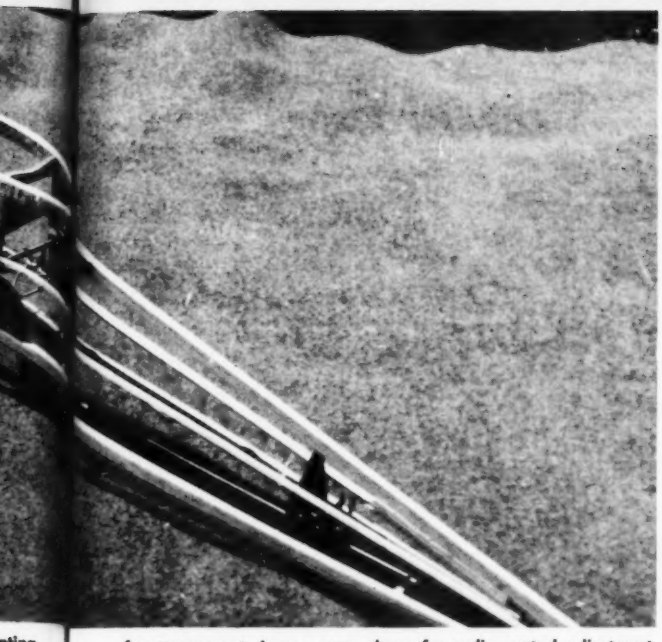
If any radio job replaces the Rudder Bug, it will be this one. Size and performance good.

The *CQ* is the culmination of three years radio control flying experience, plus twelve years in free flight, and is fourth of a series of radio ships by the designer. *CQ* is the abbreviation for "call of inquiry" used by amateurs when going on the air and calling for another station. It is the hope of the designer that the simple type of construction and excellent flying characteristics, instead of a converted free flight design or made over scale design, will entice some new member into the fine hobby of radio control flying or possibly, the experienced radio flyer will like the ship's ability to do any stunt in the book when powered with a *19* engine. The design also features "split rib" construction of the wing panels.

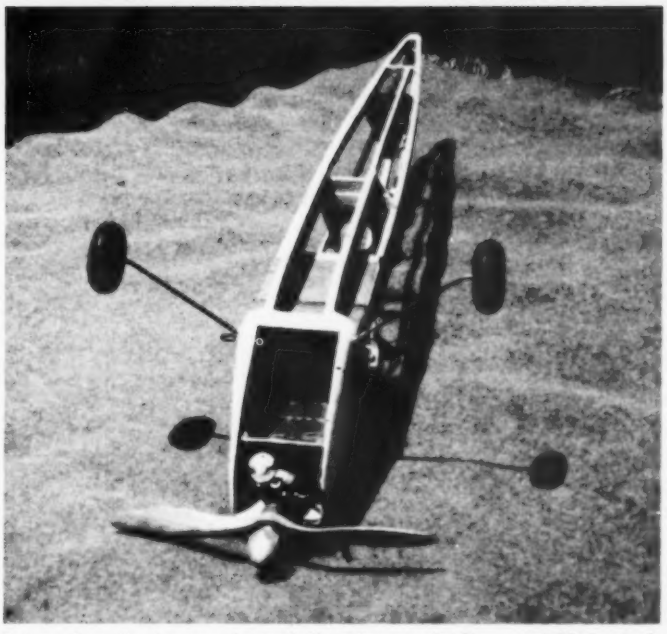
The use of twin rudders was decided upon to improve rudder effect in turns after power is off. Turns in the glide can be made as small as 100 ft. across for 180 degree change of direction and it is very easy to make full "barrel rolls" either to right or left while under power without undesirable effects of too much rudder control. By reducing engine speed with a controllable restricter, it is quite possible to do all the precision maneuvers of the A.M.A. rules as is borne out by the *CQ's* second place at Long Beach, California in September against larger multi-controlled ships.

Precision rules called for a flight pattern as follows. Takeoff, fly 500 ft. to marker; turn right or left 90 degrees then a 270-degree turn and return back directly over transmitter; then "S" turn crosswind; then "figure eight" crosswind; ending with a rectangle around transmitter 200 ft. on two legs and 300 ft. on the long legs. This pattern was compulsory before any other points could be earned for other stunts. Both *CQ* models, the original single rudder ship and the smaller, improved twin rudder ship, were able to complete the pattern. Radio trouble held the single rudder ship to fifth place.

To start construction, build the basic fuselage crutch of 1/4 x 1/2" material, directly over the top view on the plan. If "Citizen Radio" is planned, build crutch over large crutch drawing and enlarge base of bulkheads accordingly

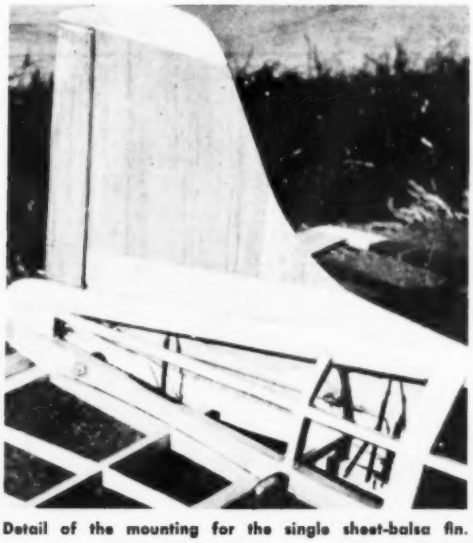


for escapement. Large access doors for radio control adjustment.



Bottom view showing two heavy belly stringers, ply floor, cowl blocks, tank.

tank gives up to 20 min. run for an .09.



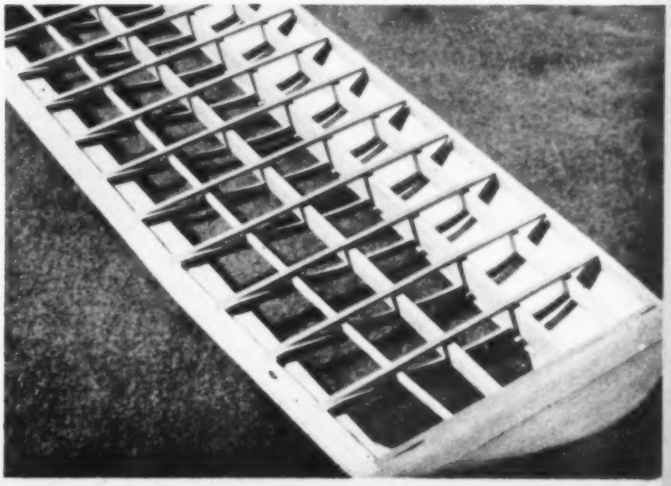
Detail of the mounting for the single sheet-balsa fin.

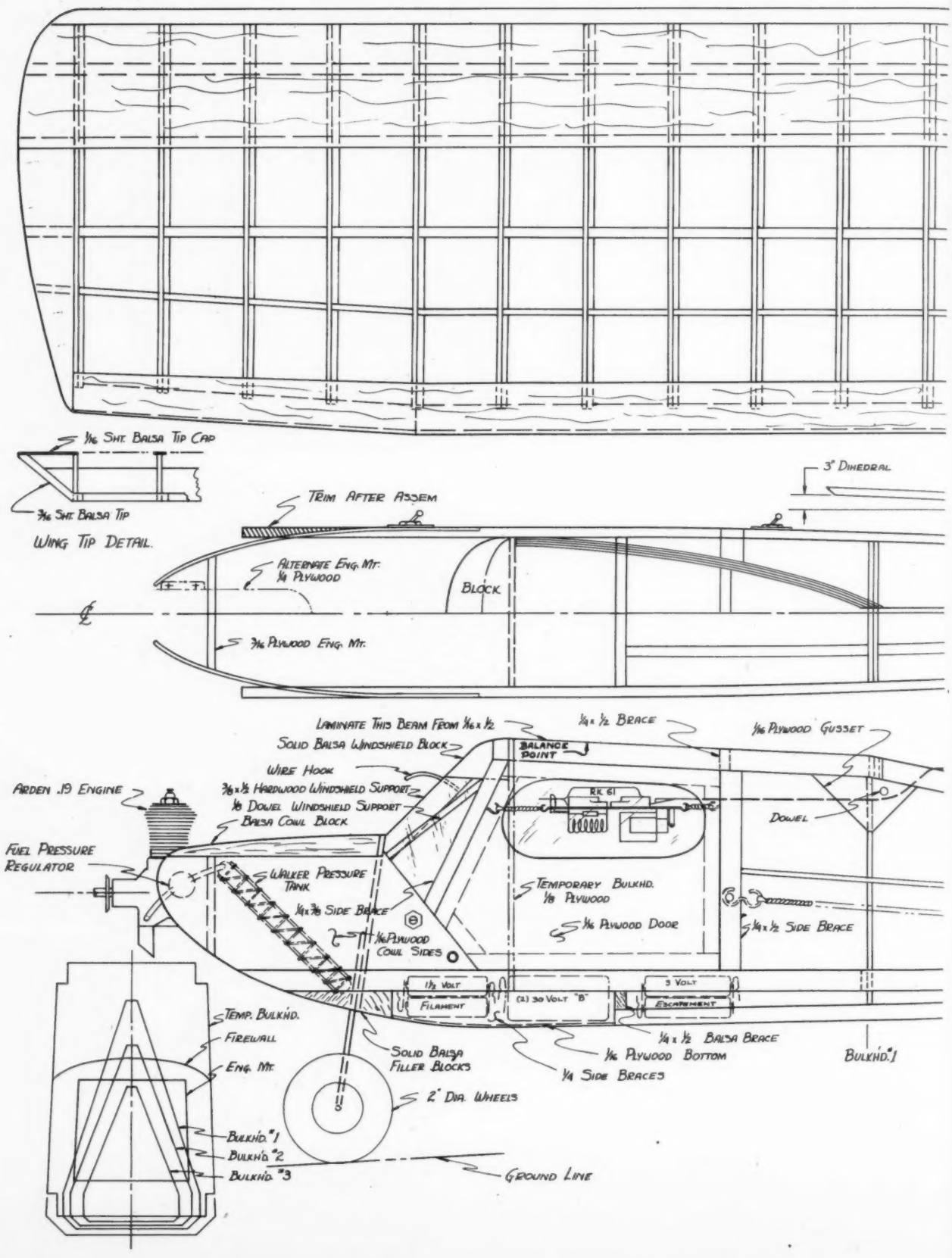
Twin tail installation gives best control traits.

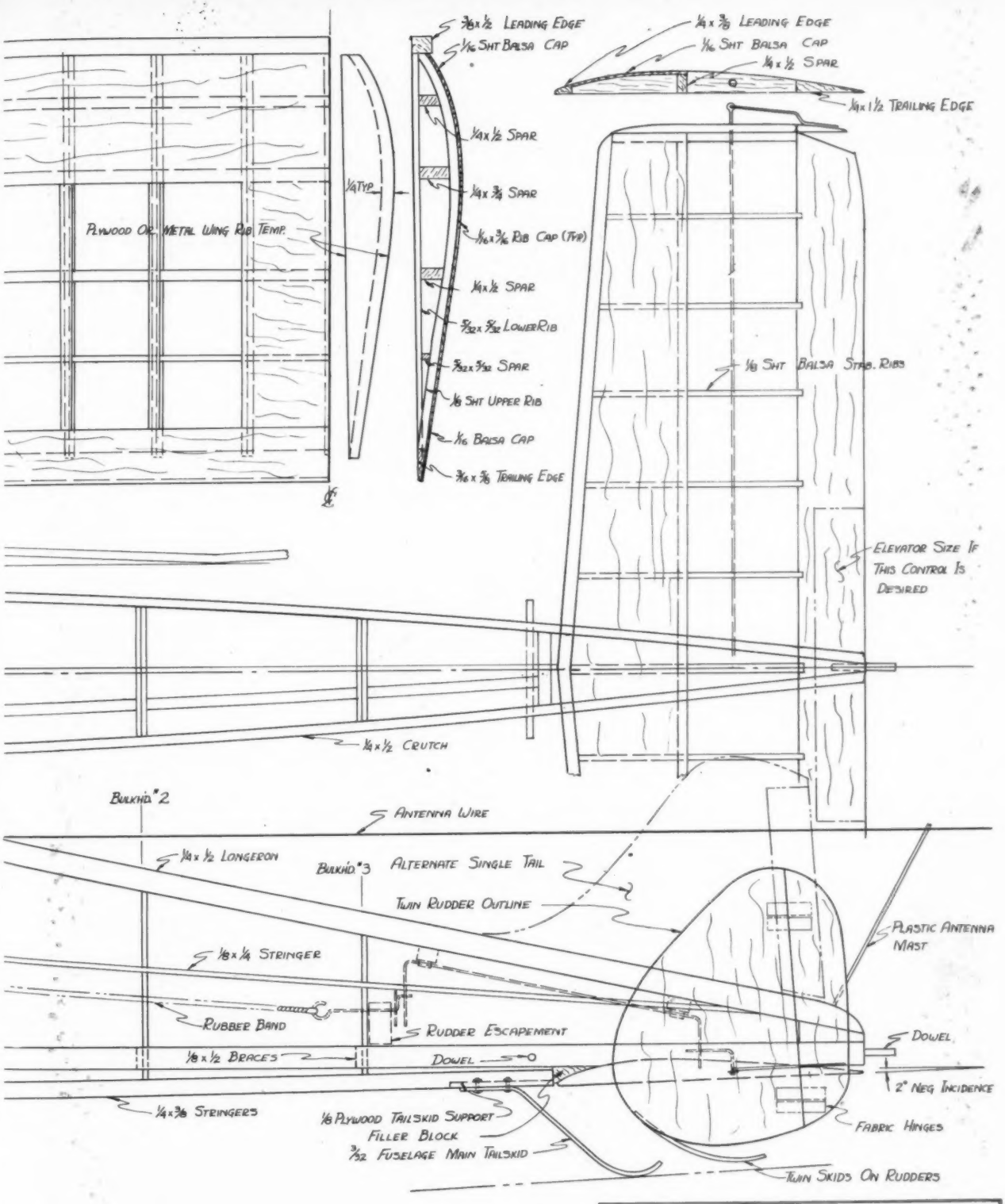
Wing construction is as ingenious and nice as the fuselage. Note four spars, rib sections cut from sheet. Flexible but strong, easy to build.

Simple structural design is brilliant.

as shown. After crutch assembly is dry remove from plan, add firewall, former number two "A" shaped bulkhead, and escapement bulkhead, first drilling holes to mount escapement. Tack cement the temporary cabin bulkhead, then add windshield block, backbone strip, and wing support strips over door openings built up from 1/16 x 1/2" strips, as indicated on the plan. Combination plywood cowl sides and engine mount are cemented to top edge of fuselage crutch and to firewall. When dry, cement forward of firewall and pull together at engine mount bulkhead. After cement has set. draw two plywood side pieces together and brad to 3/16 plywood engine mount. Alternate engine mount is shown for beam type engines. Top balsa cowl block is then cemented in place and shaped to rounded contour on top. Cut out block at front end to fit engine used. Upper side stringers of 1/8 x 1/4" are then added, using scraps for shims under stringers at number two bulkhead. Two bottom keel pieces are of heavy 1/4 stock to re-inforce cabin under door cutouts. Keel pieces (*Continued on page* 48)




1/16 Sht. Balsa Tip Cap
3/16 Sht. Balsa Tip
Wing Tip Detail.
Trim After Assem
3° Dihedral
Alternate Eng. Mt. 1/4 Plywood
Block
3/16 Plywood Eng. Mt.
Laminate This Beam From 1/16 x 1/2
Solid Balsa Windshield Block
Wire Hook
3/16 x 1/2 Hardwood Windshield Support
1/8 Dowel Windshield Support
Balsa Cowl Block
Arden .19 Engine
Fuel Pressure Regulator
Walker Pressure Tank
1/4 x 3/8 Side Brace
1/16 Plywood Cowl Sides
1/4 x 1/2 Brace
1/16 Plywood Gusset
Balance Point
R.C. 61
Dowel
Temporary Bulkhd. 1/8 Plywood
1/16 Plywood Door
1/4 x 1/2 Side Brace
1 1/2 Volt Filament
(2) 30 Volt "B"
3 Volt Escapement
Temp. Bulkhd.
Firewall
Eng. Mt.
Bulkhd. #1
Bulkhd. #2
Bulkhd. #3
Solid Balsa Filler Blocks
2" Dia. Wheels
1/4 Side Braces
1/4 x 1/2 Balsa Brace
1/16 Plywood Bottom
Bulkhd. #1
Ground Line



THE "CQ"

RADIO CONTROL MODEL

DESIGNED BY E. J. BROWN

DRAWN BY G. S. OLIVER

official news

by RUSS NICHOLS
and CARL WHEELEY

Details and the who-is-who of California Nationals • Complete Contest Calendar • Rules questionnaire results

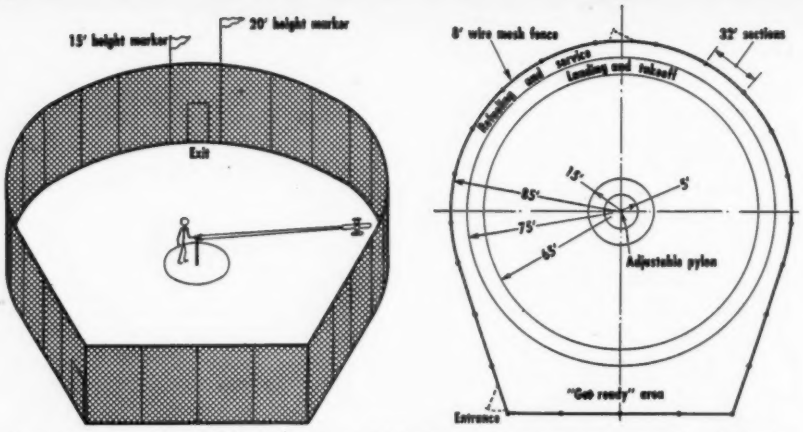
NATIONALS SHAPING UP. Plans for the '52 Nats, to be held July 27 through August 3 at U.S.N.A.S. Los Alamitos, Calif., are progressing under the guidance of John Bollinger, Contest Director. The major committees will have most of the details worked out as this is read.

Outstanding modelers are at work on the Nats. To name a few: Contest Director—J. M. Bollinger; Assistants—Keith Storey and Dick Everett; Control Line Director—Les McBrayer; Free Flight Director—Dick Everett; RC Director—Dick Schumacher; Procedure Committee—Keith Storey, Bob Holland, Russ Johnson, and Wallace Short; National Champ and Point System Committee—Russ Johnson, Dick Everett, F. L. Swaney, Bob Swenson, and Lew Mahieu; Field Committee—F. L. Swaney, Sal Taibi, and Bud Barkhurst; Trophy Committee—Lew Mahieu and John Brodbeck; Scheduling Committee—J. M. Bollinger and Keith Storey; Banquet Publication Committee—Jim Saftig and Dick Everett; Program and Entry Blank Committee—Lew Mahieu, Bob Moncrieff, and John Brodbeck.

For entry blanks and information, write to AMA.

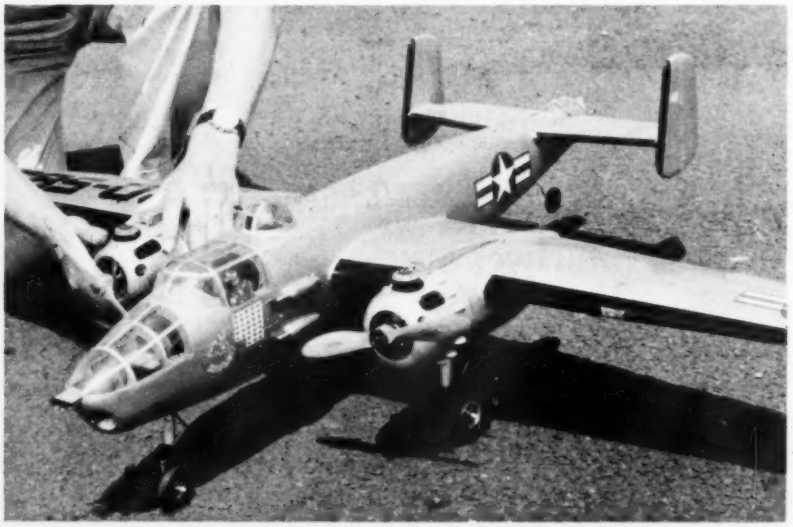
RESULTS OF TRIAL RULE QUESTIONAIRE. Ray Matthews, AMA Contest Board Chairman, assisted by the entire 1951 Contest Board, has tabulated results of the trial rule questionnaire which was circulated just before the close of 1951. Although the results of the questionnaire have nothing to do with deciding what the next rule changes will be, other than to decide what proposals will be put to a vote, the nation-wide thinking of modelers proves interesting. The categories of models for competition are too many.

Contestants must build the models they enter in all events. Team entries must be made in the age class of the oldest team member. There should be only two age classes for competition and records. License numbers required on models (*Continued on page 44*)



Ideal for city-sponsored flying area is prefabricated model airport suggested by Al Davis, Chicago. Installation, either permanent or portable, provides maximum spectator safety.

With spring weather this will be common sight all over country. Picture taken in Bronx last season shows an excellent *Texan* and *SE-5* plus couple of remarkable bi-motor originals.



Big favorite of two-motor ukie fans is the B-25. (No, we don't have plans!) Sentiment of builders at large is that scale jobs should be required to fly, but be given no points for doing so.

SOMETHING NEW

HAS BEEN ADDED TO

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For 1952 rules and specifications, write: Educational Director, 28-19 Bridge Plaza North, Long Island City 1, New York.

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July 27 - August 3
U.S. Naval Air Station
Los Alamitos, California

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(All classifications)

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2nd . $ 50 and Bulova watch
3rd, 4th, 5th . Bulova watches

The champs are going to be wearing Bulova watches.

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*Trade-Mark, Reg. U. S. Pat. Off.

RICH & LEAN

It takes all kinds of opinions to make the modeling world go round.

Well, Now . . .

In the November issue, Robert L. Hatschek wrote an article about prefabrication. He said that prefabrication was placing model building on a toy basis. I agree that what he said was not entirely false but I have a different view.

In April 1951, I bought a model *Firebaby* with a motor. This model provided me with hours of fun. . . .

I have made more models and you may be sure they have not all been prefabricated. While building ships is fun, I think flying is more fun. I don't see how youngsters with no previous experience could hope to build a model with plans and a bunch of sticks. After some experience, this is possible but prefabricated models are necessary to introduce the youngster into model building.

Dennis Robb
Minneapolis, Minnesota

Relax, Son

Some two months back, the familiar World War I article and plan unit was replaced by a write-up of a post-W.W.I plane. . . . The February issue should have had some W.W.I plane under discussion. Instead, the Curtiss Robin—of even less interest than Thomas-Morse planes to W.W.I enthusiasts—was the plane selected.

I hope that this is not an indication that the W.W.I series is on its way out; it is about the only source of information left now, and should be maintained. . . .

Don't let a revered and valuable series slip out of existence.

David W. Hart
Iowa City, Iowa

On the Other Hand

Last night I purchased my February issue of *Model Airplane News*, which I have been reading for more years then I am willing to admit. On page 47, your Twenty Years Ago reminds me that we are growing old together.

The purpose of this letter is to thank you and compliment you for publishing the beautiful detailed drawing of Curtiss Robin airplane by Mr. Nieto. The Robin still holds a place in history as one of the sweetest flying jobs ever built and even by today's standards it's a good looking aircraft. Hope you will continue to present more planes of this era.

M/Sgt. Paul A. Fleming
Miami, Florida

Those Were The Days

I like the new series Twenty Years Ago. I went to the basement and dug out some of the first ones that I purchased in 1929. They are a bit moldy and mouse chewn but are still readable in parts.

The prices are sure different than what they are today. I can remember when I used to order five cents worth of balsa, ten cents glue, then use the paper table napkin to cover the job.

Yours for more and better models.

Clark M. Tassie
Port Alberni, B.C., Canada

Swedish Bird

Hereby I send some photos of "the Amazing Bird," your AA control line plane published in M.A.N., March 1951 issue. As you can see from the photos, I have converted the engine. It flies very nicely and I'm very content with my little plane.

At the same time, I would like to express appreciation of your magazines and the very good plans in it.

Berkel Heimer
Bromma, Sweden

How About the Nats?

Why do model builders try to hold a Nationals in their own back yard each time they organize a local meet?

They find that the job is far too great for them and they usually attribute the failing to the fact that there are too many model events.

Each of us has the right to build models of our preference and powered with whatever type, or size, of locomotion we prefer. Yet, there are many that feel that they, the "real model builders," should not allow the minority groups the right to have rules and standards by which they can fly. Why, if two builders wanted to compete with flying umbrellas, they have the right to frame rules.

Rules are standards that are available to people who are *interested* in them. Those not interested can easily skip over them. What is this all-or-nothing-at-all feeling?

If they allowed us to eliminate all of the events that we didn't like, or felt we didn't want, I'd meet you over at the local boat pond tomorrow.

How about letting all the categories stand and letting the contest directors and meet organizers make their own choices?

Bob Buragas
Arlington, New Jersey

You Heard What He Said

Enclosed is a photograph of my modified *Warrior* stunt model. . . . Power is a reworked Ohlsson & Rice .33 engine.

The modifications: spring steel tail wheel, shortening of the wing by cutting three inches off of each tip, and increased elevator and rudder area.

I am 18-years old and have been building model airplanes since 1940. I like all types of models with the exception of free flight and Half A. I estimate this to be my 200th model plane.

If there is a better model airplane magazine on the market today other than M.A.N., I have yet to see it. . . .

Jerry Smith
Fort Thomas, Kentucky

How Could We?

I think your March 1952 cover is one of the best in months. But tsk, tsk, how could you? That plane is *not* a Republic XP-72, but a Republic XF-91.

Michael Tauber
Seattle 99, Washington

Parlor Flip Flops, Phooey

More power to Eric Saunders of Canada in the February issue. Anything powered with anything under a .60 or .65 is a toy. Flying a *chief* or such with a .29 is strictly for the birds. For a real thrill, power it with an Anderson or Orwick. . . . I agree with him entirely that a few less AA plans may give *real* stunt the shot in the arm it deserves, not flip flops in the parlor.

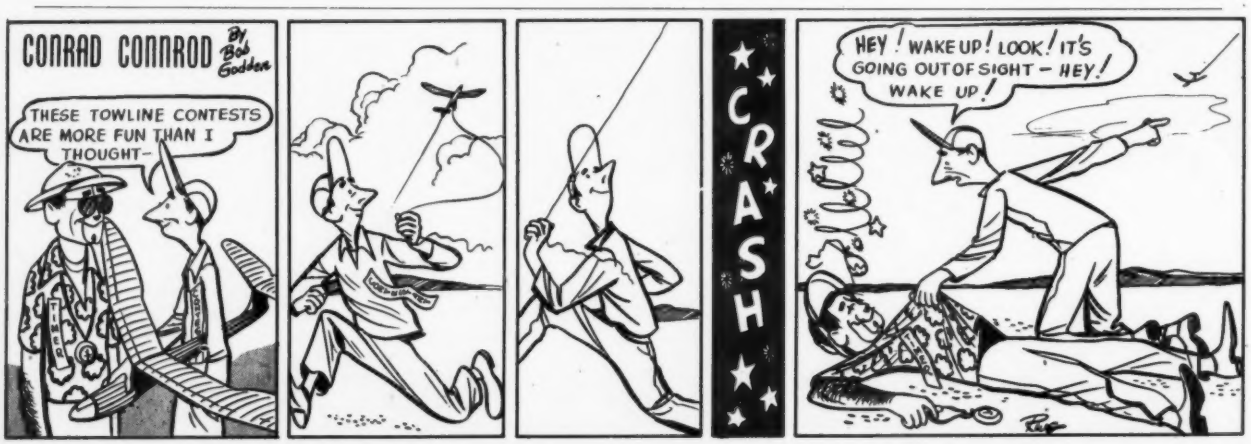
With the present set-up, outside radio, it's no wonder more and more people refer to our first love as "toy" airplanes.

Monty Tyrrell
Kew, Victoria, Australia

CO^2 Man

What happened to CO^2 as far as contests are concerned? What has Half A got that CO^2 hasn't got? As far as I can see, nothing. I can see quite a few good features in favor of CO^2 though. There is no messy glow fuel smeared from one end of the ship to the other, eating away at the finish, no dry cells, glow plus, needle valves, etc., and one flip of the prop "sets them off" in any kind of weather, to save tempers and bruised fingers.

Cliff Bergseth
Seattle 6, Washington


CONRAD CONROD By Bob Godden
THESE TOWLINE CONTESTS ARE MORE FUN THAN I THOUGHT-
CRASH
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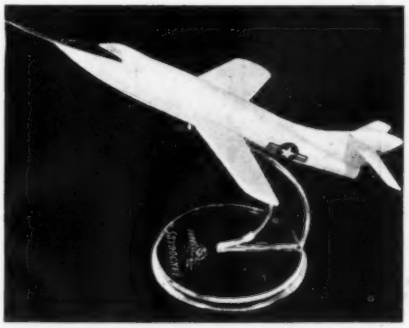

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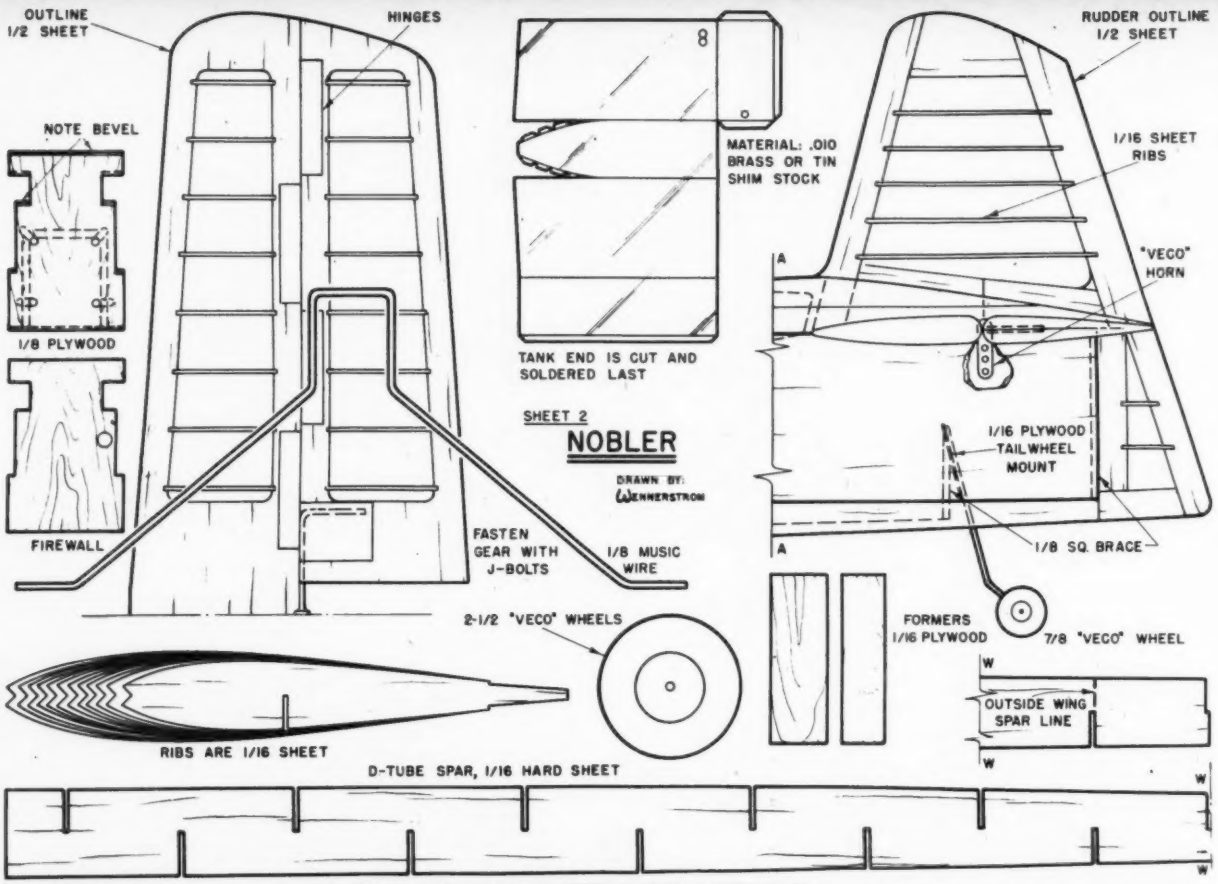

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Stunting Can Be Smooth

(*Continued from page 14*)

overhangs rear of fuselage. Mark off space where rudder joins and finish cutting and sanding. Carve out space that cockpit will occupy and finish sanding except for nose. Remove block and mount engine with tin plates under the nuts. Solder nuts in place on tin so that engine may be removed without trouble. Replace top block on fuselage after cutting away space to receive mounting bolt nuts. Put 1-3/4" spinner on engine and finish off upper part of cowl by adding two 1/2" x 1/2" x 11/16" blocks directly in front of mounts and sanding to shape. Top unit may be removed now and hollowed out to 1/4" wall thickness except where otherwise noted on plans.

Take the pins out of trailing edge. Cement 3/16" x 1/8" filler strip on lower half of trailing edge, making cement fillets on each rib. Add top half of trailing edge and pin it in place. Pin, weight or clamp trailing edge to board until it is thoroughly dry.

Cement 2-1/8" x 2-1/8" x 2-1/4" block to part of bottom block that is removable cowl. Remove engine and notch out wood to let block sit flush around protruding landing gear. Carve the cowl to outside dimensions and sand roughly. Mount engine again and hollow out cowl by trial and error method to illustrated thickness. Sand roughly and cut out cowl openings. Finish by hollowing out remaining portion and sanding. Top block should also be hollowed to fit engine.

Wing should be dry enough now to remove from board. Add 1/4" leading edge, double coating center splice with cement. Next cut bellcrank mount of 1/8" plywood. Cut horizontal notch out of spar to receive the mount and cement in place on supports. Use several coatings. Drill hole for bellcrank bolt, mount bellcrank, cementing nut to bottom of plywood mount. Cut away insides of number one ribs until bellcrank rotates freely. Cut leadout wires, allowing enough for wrapping and free movement. Remove whole bellcrank unit, except for nut on the mount, and wrap leadout wires to bellcrank. Cut holes

in ribs at proper positions to take wires. Insert wires in wing and bolt bellcrank back into position. Now add the 1/16" sheet leading edge covering both top and bottom. Dampen the *top* of each sheet as it is pinned down. As water evaporates, wood will warp around leading edge, forming better point. Add first layer of 1/16" center section, top and bottom. Set aside to dry.

Before the stabilizer construction is started, prepare Veco control horns by soldering brass bearings in place. This is shown in sketches. Stabilizer and elevator can be made of either 1/2" sheet or built up from 1/2" square and pieces of 1/2" sheet. The sheet method was quicker though more expensive. Cut two 1/2" x 3" x 21" pieces of medium softness and spot cement together for a 1/2" x 6" x 21" slab. Trace outline of both elevator and stabilizer onto this sheet. Cut, carve, and sand whole pieces to symmetrical airfoil. Split apart cement joints to have three pieces—two elevators, and stabilizer. Cut out center sections and notch to take 1/6" ribs. Do not cut out each rib separately. Cut ribs in rectangular form and cement in place. When dry, cut and sand assembly to shape. Drill holes that take Veco control horn, cut slots and cement horn in place. Reinforce horn with strip of pinked aircraft tape over spot where each prong is set into wood. Hinge two together at this point with pinked tape.

The 1/16" top or double covering is added to center section of wing. While drying, add 1/16" sheet tips and tip braces. Cut cap strips and cement in place. Allow to dry.

Like stabilizer, rudder can be built up, instead of cutting shape out of one sheet. Cement together two pieces of 1/2" sheet, one 3" x 5-5/8", other 3" x 5". Trace rudder outline and add remaining section, which is lower tip of rudder. Allow unit to dry, carve, sand to airfoil. Note that this is *lifting* airfoil. Now cut out portions shown, notch and add ribs as described in stabilizer construction.

Wing may now be sanded to final shape. Particular care should be taken as it will go a long way toward appearance. By sanding center section against grain with 280 wet or dry paper on a block, a very clean, even surface is obtained. Cap strips should be separately sanded, gently rounding edges. 1/8" brass tubing should be cemented in place on inboard wingtip. These serve as lead-out wire guides.

Select two medium firm 1-3/8" x 3" x 36" grained sheets of 3/8" x 3" x 36" for flaps. Cut to shape, carve and sand. Also drill holes and insert Veco control horn as described in elevator description. Cut twelve 3" x 1-1/4" hinges of pinked aircraft tape. The hinges nearest to fuselage on either side are sewed together and cemented in place. Done correctly, hinge material will show on both top and bottom of wing and flaps. Wing is covered and doped except for upper half of outside wingtip. This is left open for weight. Do not add now. I covered with wet, heavy duty *Silkspan*, but silk or nylon may also be used. One coat of dope is sufficient.

Coat the space between firewalls several times with a 50-50 mixture of clear dope and cement. Cover joints, and motor mounts thoroughly.

To assemble wing and fuselage cut a slot in each fuselage side as shown on plans, 2-7/8" long and 7/16" wide. On right hand side, cut a 5/16" x 7/8" slot to allow control horn to pass through. Save these three pieces as they will be replaced when wing is cemented in place. Cut out two small portions in the center section of wing to allow for pushrod. Bend flap pushrod of 1/16" music wire and place in position. Once sure that it works freely, remove until wing is cemented in place. Slide wing into fuselage and center; using cement generously, cement and pin it in position. Replace pushrod and solder in place using 1/4" washer. Stabilizer is now covered. I used heavy duty *Silkspan*. Apply one coat of dope only at this time.

Go back to fuselage and cut out section that is to receive stabilizer. Cut out 1/16" plywood formers and set into position but do not cement. Pin stabilizer in place and cut piece of 1/16" music wire to approximate length of pushrod. By making a small mark on side of fuselage at height of hole in ele-

(*Continued on page 42*)

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MODEL	50	100	200	350
ENGINE WEIGHT	.2 oz	.6 oz	1.1 oz	2.5 oz
FUEL WEIGHT (MIN.)	.2 oz	.28 oz	.3 oz	.4 oz
TOTAL WEIGHT	.4 oz	.88 oz	1.4 oz	2.9 oz
THRUST (MAX.)	.6 oz	1.2 oz	2.5 oz	4.0 oz
DURATION - ONE CHARGE	12 sec.	20 sec.	20 sec.	12 sec.
DURATION - TWO CHARGES	—	—	32 sec.	24 sec.
DURATION - THREE CHARGES	—	—	—	36 sec.
TORQUE	NONE	NONE	NONE	NONE
EXHAUST VELOCITY	1200 ft/s	1200 ft/s	1200 ft/s	1200 ft/s
OVERALL LENGTH	1 5/8"	2 1/4"	2 7/8"	3 3/4"
MAXIMUM DIAMETER	11/16"	1"	1 1/32"	1 3/8"
EFF. WINGSPAN	12-20"	18-30"	24-36"	32-54"
ENGINE PRICE ①	$1.95	$4.50	$5.95	$8.95
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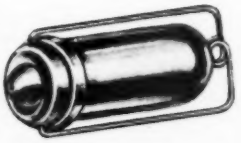

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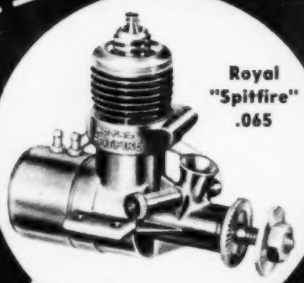
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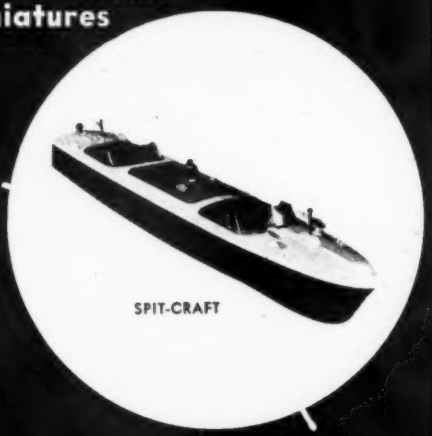
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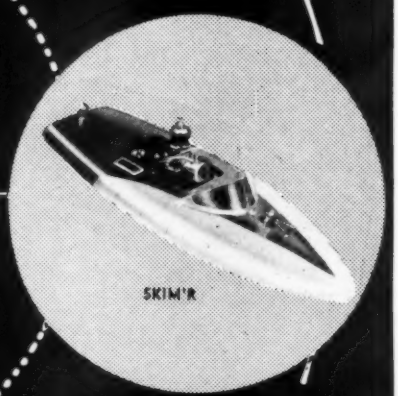
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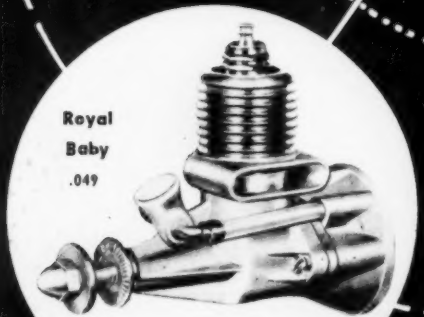
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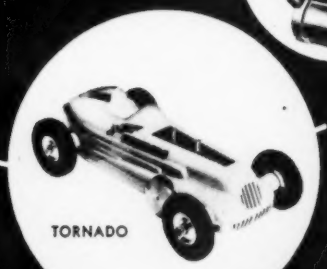
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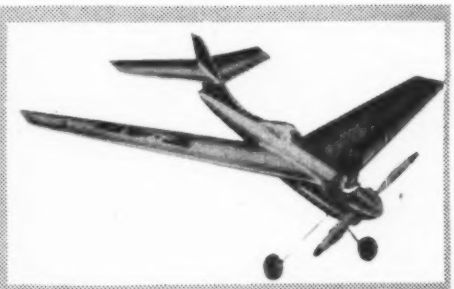

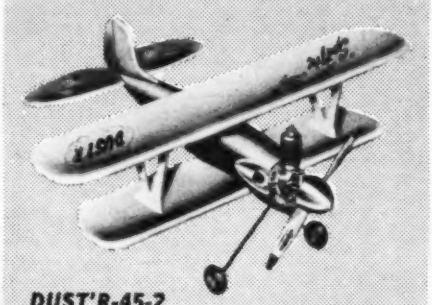

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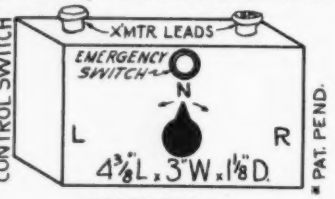

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vator control horn, then doing the same with flap control horn position, you will establish first means of locating holes in 1/16" plywood formers. Draw a line connecting these two points. Measure distance between line and top of fuselage sides at point where the formers are located. Remove formers now and, with stabilizer in place, bend pushrod to shape and place in position. Looking down from top, mark position of pushrod onto formers where they sit in fuselage. Add other measurements on formers and drill a 1/8" hole where marks intersect. Remove pushrod, cement formers in place and connect pushrod to flap horn by means of 1/4" washer and solder. Stabilizer is connected to pushrod by same means and cemented into position. If both flaps and elevators are not neutral when bellcrank is, slide stabilizer forward or backward until they are. Proper control linkage on a flap model is most essential.

Before cementing top and bottom blocks in place, make these final adjustments. Notch out top block so that it will fit over 1/16" plywood formers. Add 1/16" sheet balsa cockpit bottom at this time. Cut tail wheel mount out of 1/16" plywood and mount brace out of 1/8" sheet balsa. Bend tail wheel gear out of 1/16" plywood, drill 1/32" holes in mount around gear shape, and sew in place with soft copper wire or nylon thread. Cement 1/8" sheet brace and tail wheel in place as shown on the plans. When this is dry aft part of bottom block can be cemented in place. So that block will fit around the tail wheel gear snugly, drill a 1/16" hole and thread it on gear before doing any cementing. Also replace three pieces that were removed for wing installation.

At this time that gas tank should be made and installed. Do not use acid core solder on the tank or any other part of model. The acid flux will cause wheels and controls to freeze and become immovable. Resin core solder and a good grade of soldering paste gives a strong neat joint. Use 1/8" brass tubing as it gives better air pressure and fuel flow. When bulk of the tank is finished, rear end of tank will be left open. Install all tubes and make cover plate for back end.

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Top block is cemented into position now. Before installing tank, smear inside of top block between two firewalls with 50-50 mixture of clear dope and cement. Tank should fit snugly in place but, to make sure it stays put, cement a sheet of 1/8" balsa over top. This too should be smeared with dope and cement mixture. Add cowl, hold down block by notching fuselage bracers and cement it in place.

Give rudder a final sanding with 320 wet or dry sandpaper and cover wet with heavy duty *Silkspan*. Brush on one coat of clear dope and set up to dry. Cut out the slot in top block that houses rudder, being sure to have lifting side of rudder on proper side. Also make sure slot is cut with correct offset. Cement rudder in place.

Cover the portion of fuselage from wing leading edge forward with silk and the rest with Japanese tissue. However, you may cover entire fuselage with silk. I would advise it now, as tissue did not hold up too well on original model. Remove engine. Do as much as possible in large portions. Lay the silk in position and dope it to wood. As silk is very porous, you can dope right through it. Before covering around wing first, make fillets of either plastic balsa or some other similar substance. If you do use something else for fillets, use full proof clear dope to adhere silk to them if you are intending to use full proof dope for finish. Also add flap and elevator fillets. These are made of balsa and carved to shape of surfaces. After entire model is covered, including flaps and cowl both inside and out, add just enough weight to outer wingtip to make it slightly heavier than inboard tip. Cover remaining part of tip and give it a coat of clear dope. For an undercoat, I used fuel proof filler coat. There are several types of wood filler on the market.

First brush two or three coats of fuel proof clear dope on fuselage, cowl and fillets, sanding between each coat. Now add a coat of undercoat to these surfaces and allow to dry about 45 minutes. Wet sand this with 280 sandpaper. Repeat this action two more times, using 320 sandpaper second time, and 400

third time. Take special care in taking out all bumps and small pits that will mar the finish. Any parts that don't look satisfactory should be touched up and sanded again.

Wing, rudder, elevator and stabilizer are given four or five coats of fuel proof clear dope. To acquire a very smooth finish, sand very lightly between each coat with sandpaper.

If you do not wish to make canopy of wire, a bubble canopy may be purchased. By trial and error method, you can shape a very neat looking canopy of 1/16" music wire or brass tubing. After each piece is shaped, tie them together with fine copper wire and solder. Celluloid can now be sewed in place with thread and cement. Add as much detail to the cockpit as desired and install pilot. Drill holes in fuselage to receive canopy, cement and sew it in place. Drill hole in cowl to take tie-down bolt and insert a grommet in wood to hold bolt.

Spray or brush on final coats of colored dope. Spraying requires much less work, spreads dope evenly. If you brush, you will have to both watersand and rub the model with rubbing compound. Rubbing compound and wax is all that is needed when you spray. Be sure to cover the cockpit with masking tape before painting. Use your own discretion about color and trim. However, don't put white over red, as red will bleed through white, making it pink.

Wheels may be soldered on along with landing gear fairings. Install engine and cut spinner to fit propeller. With the Veco, *Torpedo* and Fox motors install a 9" x 7" and 10" x 6" Veco, and the 10" x 5" Y and O propellers.

Select calm weather for initial flight. Check model for warps and test run motor. If any warps are present, remove them as described. First time I flew model, wind was blowing gently at about 35 mph. Regardless, I took model directly overhead and proceded to do overhead eights experiencing no trouble with slack lines.

The Funster

(*Continued from page* 18)

lightly and rounded on leading and trailing edges.

As downthurst and side-thrust are very important, check downthrust 3/16" and side-thrust to the left 1/8" after trimming nose, then cement firewall in place.

Cut with razor blade or knife a 1/16" slot at the small end of fuselage for the stabilizer, insert same and cement in place. Next cement pylon to fuselage so that it is even with the back of firewall. Set rudder in place at zero turn and cement.

After rudder and pylon are dry, cement wing on pylon, turn model upside down on table placing an equal length block under each tip of the stabilizer. This will assure correct alignment of wing to stabilizer. After an hour, re-cement all joints and let model dry thoroughly. Drill two number 55 holes for engine in firewall.

Apply two or three coats of sanding sealer, sanding lightly between each coat. Now apply two or three coats of colored dope and trim as desired, then fuel proof complete model. Do not use an excessive amount of dope, but just enough to attain the finish necessary. The model should weigh two ounces complete with engine and propeller.

Fasten engine to firewall with two 3/8" number three round head screws. Cut propeller to shape of pattern furnished, starting with a Tornado 5-2 propeller or any other wooden propeller of similar type. A regular *Infant* metal propeller may also be cut to shape and used very successfully.

Start testing by hand gliding several times. The model should glide fast but flat. After test gliding, start engine and run slightly rich for the first few flights. The *Funster* should power in a fast left spiral climb, and also should glide in a gentle left circle.

Do not let the thought of left-thrust bother you because, in the case of this little job, the airplane and thrust work together instead of fighting each other, and therefore make a very efficient combination when properly adjusted.

After the test flying is over, crank it up and give it all the power it has. You will get a thrill every time you see it go up.

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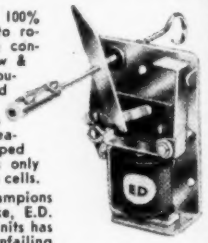

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For the R.C. Fan

(*Continued from page 27*)

compound escapement does, so it is only hot when the compound escapement is hot (energized) or, in other words, transmitter on. This switch closes every time the star wheel tab comes around, but it will only operate a second escapement if the signal is on at the time. The wiring diagram of figure 5 will further clarify this. This second escapement can operate anything. But in figure 3 is shown a standard Bonner escapement rigged to give two speed motor control and cut-off. This method of motor control is known as the double needle valve method and seems to be the most reliable method for glow plug operation. In the West, we swear by the glow plug and defy anyone to prove that the fuel is hard on our ship's structure. Even if so, we can always use an overboard exhaust extension that will make sure that the stuff will miss everything but the tail. Mr. Brodbeck of K & B motors showed radio control modelers some sympathy by making available an intake for his 19 engines that will accommodate two needle valves. Anyone knows that a needle valve will draw air instead of fuel if there is a leak in the fuel hose. So we turn these needle valves off or on by opening or closing an air bleed in the respective fuel lines. The high speed needle valve air bleed can be seen as a rubber pad, centered to the armature and resting on a pipe under the escapement coil in figure 3. This air bleed is closed (and the high speed needle valve draws fuel) as long as the escapement is relaxed. This bleed is only open when the escapement is energized by the third signal. In figure 4 we see another bleed valve operated by the crank of the same escapement. This escapement has four positions—two energized and two relaxed. In two energized and one relaxed position, the bleed valve is open. The bleed valve is shown in the relaxed open position. Since this bleed valve is open, its needle valve cannot draw fuel. But since the escapement is relaxed, the other bleed valve is closed and its needle valve can draw fuel. This is high speed because only one needle valve drawing fuel gives a lean or high speed mixture. If the low speed bleed valve of figure 4 were closed (in the relaxed escapement position) both needle valves would draw fuel, giving a rich mixture or low speed. But in any energized escapement position, both bleed valves would be open, neither needle valve would draw fuel and the engine would stop. This is cut-off and the number of seconds to cut-off is determined by the location where the bleed line is teed into the fuel line. We tee the low speed bleed line into the low speed fuel line as close to the engine as possible to get a quick change from low to high speed. But we teed the high speed bleed line into the high speed fuel line about one inch from the needle valve to get a three or four second delay before the engine quits. The motor control escapement is mounted in the fuselage and never gets gummed up with fuel because all it ever handles is good clean air.

Now that we have certain and reliable separation of rudder control from a second control, this second control could be elevator instead of motor control. Since motor control and elevator control give two distinct types of flying, we don't need them at the same time. Motor control is for low altitude flying whereas elevator control is for dives and straight away loops which require a safe altitude. So, we set our motor control escapement in high speed, disconnect the wires and connect them to another escapement which operates elevator on the third signal. Since up elevator is not necessary if you have a generous amount of down, we cut off one bar of a standard escapement so that it will only stop in down on signal. When released, it will swing thru up but go to neutral. This gets us our drives and loops with the least possibility of a mechanically or mantally stuck elevator which can be very dangerous.

Official AMA News

(*Continued from page 34*)

should be at least one inch high. AMA combat rules should be established. A six-minute maximum time limit should be adopted for all out-door free flight events. There should be a method for eliminating ties for maximum times. Free flight gas rules should be left as is except for the maximum time limit. There should be no classification for jet or jetex-powered free flight models.

All present classes of rise-off-water free flight gas should be combined. Add an A event to control line speed with a maximum displacement limit of .05 cu. ins. and combine present C and D classes. The present control line wire sizes are satisfactory. Metal speed pans for control line models should be stamped or engraved with the builder's AMA number and not allowed to be used on another flyer's model. There should be no wing loading requirements for unlimited rubber models. There should be no cross-section requirement for unlimited rubber models. All classes of towline gliders should be combined. The cross-section requirement for towline gliders should be eliminated. Allow a 100-meter (328 feet) towline for gliders. The wing loading requirement for towline should be retained. All classes of both indoor and outdoor hard-launched gliders should be combined. A classification should not be provided for catapult-launched gliders. A maximum time for flights of radio control models at contests should be established. The majority wanted ten minutes. The control line precision acrobatic (stunt) rules should be left as is. Control line flying scale models should be required to show their ability to fly only with no flight points being given. Free flight gas flying scale rules should be established. The event should have a maximum displacement limit of .05 cu. ins. and the event should replace the present rubber-powered flying scale event.

In addition to the direct answers given, many suggested that F.A.I. Nordic Glider (A/2) and F.A.I. rubber rules be incorporated in the AMA rules in place of the present towline glider and unlimited rubber classes. For indoor rubber models, the answers given were not decisive but indicated that two indoor rubber classes should be adopted instead of what we now have: 1—An unlimited event; 2—A tissue-covered model event with certain restrictions.

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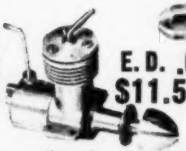
Bore 0.437, Stroke 0.400, speed 7000 RPM, Thrust 12 oz., Weight 2¾ oz. Disc inlet valve with induction pipe through center of fuel tank. Class ½ A.



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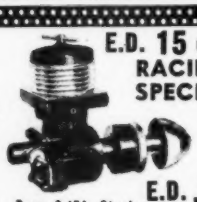

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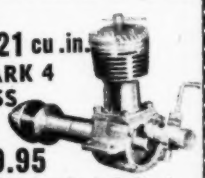

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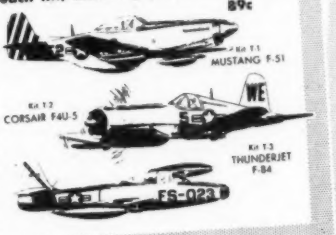

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Ray Matthews, appointed again as Contest Board Chairman, plans to put out at least one more trial questionnaire before the final proposals are put to a vote. When it will be ready, we don't know but it will contain the new thinking that was evidenced.

CONTESTS

May

4 —*Easton, Pa.* Model Airplane Doctors' Record Trials for FFG, OR, TLG, and CL. Joseph Groman, Jr., Contest Director, R. D. No. 2, Easton.

4 —*Kansas City, Mo.* Class AA K. C. MoHawks' AA Scale Contest for AA free flight gas flying scale. Robert Swanson and Stinson Smith, C.D.'s, 1413 E. 45th St., Kansas City 4.

4 —*Taft, Calif.* Taft Record Trials for FFG. Francis Stewart, C.D., 900-21, Bakersfield, Calif.

4 —Boise, Idaho. Class AA Boise Invitational Model Plane Contest for FFG, OR, beauty, CL, CLS, and CLFS. F. O. McCurry, C.D., 417 No. 10th St., Boise. Pending.

4 —*Lorain, O.* Class AA Lorain Youth Center Jolly Rogers' Meet for FFG, CL, and CLS. Ivan R. Bergman, C.D., 2214 W. 14th St., Lorain. Pending.

7-11—*Japan.* Class AAA All Japan and Korea Open Contest. S/Sgt. Bud D. Nelson, C.D., Box 224, 6400th A/C Rep. Sq., APO 323, c/o P.M., San Francisco, Calif. Pending.

11—*Bridgeport, Conn.* Class AA Bridgeport Aeronuts' Radio Control Contest. Phillip J. D'Ostilio, C.D., 47 Cardinal St., Fairfield, Conn.

18—*Mitchell AFB, Hempstead, L. I.* Annual Plymouth Dealers Model Plan Meet. Class AAA. FF, combined rubber, combined towline, payload, CLS, speed, AA to D, stunt, combat. First 500 limit. Bud Johnke, 601 Meadowbrook Rd., Uniondale, L. I., or Artie Hasselbach (Consolidated).

18—*Willow Grove, Pa.* Class A Bucks County Federation of Model Airplane Clubs' Meet for TR. Entry is restricted to residents of Pa., N. Y., N. J., Del., and Md. Frank Horn, C.D., 411 E. Newton Rd., Hatboro, Pa.

18—*Perth Amboy, N. J.* Perth Amboy Aero Club U-Control Meet. Pending.

18—*Albany, Troy, or Schenectady, N. Y.* Third Annual Capitol District Model Plane Championships for FFG, OR, HLG, CLS, CL, and combat. Theodore J. Falk, C.D., R.S.E. House, Sage Ave., Troy N. Y. Pending.

24-25—*Boston, Mass.* Class AAA New England Wakefield Elimination Contest. Edward G. Dolby, C.D., 33 Exchange St., Rockland, Mass.

24-25—*New York, N. Y.* Class AAA New York Area Wakefield Elimination Contest. Robert L. Hatschek, C.D., 42-10 212th St., Bayside 61, N. Y.

24-25—*Kansas City, Mo.* Class AAA Wakefield Elimination Contest. S. E. Smith, Jr., C.D., 228 E. 32nd Terr., Kansas City 2.

24-25—*Chicago, Ill.; Minneapolis, Minn.; Dallas, Tex.; Galesburg, Ill.; and Detroit, Mich.* Class AAA Wakefield Elimination Contests. Write to Ed Lidgard, 814 Bryan St., South Bend, Ind., for information.

24-25—*Atlanta, Ga.; Norfolk, Va.; Cleveland, O.; and Baltimore, Md.* Class AAA Wakefield Elimination Contests. Write to Wm. Fletcher, 8708 Grand Ave., Elmhurst, N. Y., for information.

24-25—*Crossville, Tenn.* Class AAA Volunteer State Wakefield Elimination Contest. Roy A. Stone, C.D., Crossville.

25—*Gardner, Mass.* Class AAA Team Racing Contest. For information, write to: Paul E. Safstrom, 29 Crawford St., Gardner. Pending.

25—*Annapolis, Md.* Class AA Control Line stunt and Team Racing Contest. For information, write to: E. W. Roberts, 800 Parkwood Ave., Annapolis. Pending.

30—*Bristol, Pa.* Class AA Bristol Aeromodeleers' 3rd Annual Flying Circus for TR, CLS, CLFS, combat, and OHLG. Clarence F. Wells, C.D., 1300 Dixon Ave., Croydon, Pa.

30—*Nashville, Tenn.* Contest for FFG, OR, CL, CLFS, OHLG, TLG, and FF scale. For information, write to: Carl V. Miller, 427 Deadrick St., Nashville. Pending.

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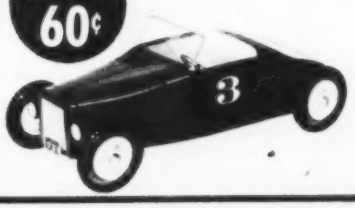

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10-8 Top Flite

Bob Ottoman
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10-6 Top Flite

Jimmy McCroskey
Iredel, Texas
Control Line-Flying
Scale Jr. KNB-32
9-6 Top Flite

Bill Lofland
Abilene, Texas
Free Flight Gas
ROW Jr., Veco 29
9½-6 Power Prop

Clifford Schaible
Roselle Pk., N. J.
Navy Radio Control
Bomb. Open. McCoy 19
9-6 Top Flite

Don Murray
West Point, Ga.
Free Flight Gas
CL C Sr., Triumph 49
11-6 Top Flite

Ernie Sheiler
Detroit, Mich.
Free Flight Gas
CL B, Open, Forster 29
10-3½ Top Flite

Curtis Franke
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CL C, Jr., Torp 32
11-6 Top Flite

Tommy Davis
Atlanta, Ga.
Control Line
Spd. CLA, Jr. McCoy 19
7-9 Power Prop.

Don Tune
Los Angeles, Cal.
CL AA Junior, Free Fl.
Torp. .049
6-4 Power Prop

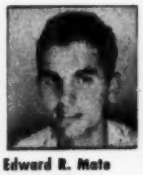
Lee J. Andrews
Norwood, Mass.
Open Stunt
Fox 35
10-6 Top Flite

Don Fergusen Jr.
Newtonville Mass.
Senior Stunt
Fox 35
10-6 Top Flite

Jack McComb
Columbia, Mo.
Sr. Free Flight
Gas CLAA, Wasp .049
6-4 Top Flite

Dick Everett
San Diego, Calif.
Open Free Flight
Gas CLAA, Torp .049
6-3 Top Flite

Bob Lutker
Ft. Worth, Texas
Open-Team Racing
K&B 29
9-9 Power Prop


Edward R. Mate
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Free Flight Gas
ROW Sr. OK Cub 09
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Scale-Open, McCoy 49
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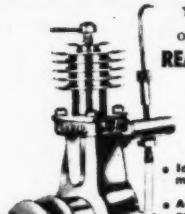

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1 —*Taft, Calif.* Taft Record Trials for FFG. Francis Stewart, C.D., 900-21, Bakersfield, Calif.

1 —*Boston, Mass.* Class AAA Greater Boston Plymouth Model Plane Contest for CL, CLS, TR, OR, PAA Load, RC, Navy Carrier, Combat, and FFG. John K. Ross, C.D., 23 Lantern Lane. Wellesley Hills, Mass. Pending.

7-8—*Oklahoma City, Okla.* Contest for FFG, PAA Load, TLG, OHLG, and OR. For information, write to: Ray Matthews, 3700 North Linn, Oklahoma City. Pending.

8 —*Lexington, Nebr.* Class AA Nebraska State Stunt Contest. Donald R. Ross, C.D., Lexington.

8 —*Bethpage, L.I., N.Y.* Class AAA Ltd. 7th Annual Mirror Model Flying Fair for CL, CLS, FFG, PAA Load, PAA Clipper Cargo, beauty, RC, combat, TR, and Navy Carrier events. For entry blanks write to: Director, Mirror Model Flying Fair, New York Mirror, 235 East 45th St., New York 17, N. Y.

8 —*Cape Girardeau, Mo.* Class AAA Ill. Mo. Ky. Control Line Contest for CL, CLS, and CLFS. Ernest E. Miner, C.D., 541 So. Hanover St., Cape Girardeau.

8 —*Lorain, O.* Class AA Lorain Youth Center Jolly Rogers' Meet for FFG, CL, and CLS. Ivan R. Bergman, C.D., 2214 W. 14th St., Lorain, Pending.

15—This is the deadline for completion of all Air Force Base Elimination Contests.

14-15—*Atlanta, Ga.* Class AAA 14th Annual Southeastern Model Airplane Contest. Pending.

15—*Rockford, Ill.* Class AA Rockford Model Contest for FFG, OR, and RC. H. E. Heminger, C.D., 836 Diamond Ct., Rockford.

15—*St. Paul & Minneapolis, Minn.* Third Annual Talent Scout Model Airplane Contest for CL, CLS, OR, TLG, and combat. Paul J. Ring, C.D., 4150 29th Ave S., Minneapolis 6.

15—*Washington, D. C.* Class AAA National Capital Model Air Show. Pending.

21-22—*Idaho Falls, Idaho.* Idaho Plymouth Dealers' Model Plane Contest. Jack H. Douglas, C.D., 133 East 2nd South St., Salt Lake City, Utah. Pending.

21-22—*Hartford, Conn.* Class AAA Northern Connecticut Plymouth Dealers and Hartford Times Meet for OHLG, TLG, OR, FFG, CLFS, CLS, CL, and TR. Crosley Fitton, C.D., 398 Oakwood Ave., West Hartford. Pending.

22—*Lebanon, Pa.* Class AA contest for control line and free flight events. Kenneth F. Carpenter, C.D., 751 N. Hanover St., Lebanon. Pending.

22—*Flint, Mich.* Class AA Exchange Club Meet for FFG, OR, CL, CLS, and CLFS. R. J. Dear, C.D., 720 Harrison, Flint. Pending.

22—*Cedar Rapids, Iowa* Class AAA 7th Annual John Pavlis Memorial Model Airplane Contest for OHLG, TLG, FFG, PAA Load, CLS, CLFS, and RC. Paul M. Marchal, Jr., C.D., 1837 8th Ave., S.W., Cedar Rapids.

22—*Red Lodge, Mont.* Class A Airscrews' Model Aircraft Meet for FFG, combat, CLS, TR, and CL. Conrad J. Erck, C.D., Box 214, Red Lodge.

22—*Hicksville, L. I., N. Y.* Class AA 6th Annual Screamin' Demons of Long Island Meet (Part One) for AA FF flying scale, AA FFG, OR, and RC. Bob Buragas, C.D., 255 Laurel Ave., Arlington, N. J. Pending (date may be changed).

28-29—*Detroit, Mich.* Class AAA Michigan State Exchange Clubs' Model Airplane Meet for OR, FFG, PAA Load, CL, CLS, and RC. Entry is restricted to residents of Michigan and Windsor, Ont., Canada. F. P. Sposite, C.D., 9900 E. Jefferson, Detroit.

29—*New York, N. Y.* Class AAA Gas Monkeys' Fifth Annual Championship Contest for FFG and PAA Load. Ernest V. Roff, C.D., 56 Stuart Ave., Malverne, N.Y.

(Due to many contests only those for next 60 days are listed—The Editor)

Talk About Scale

(*Continued from page 13*)

realism, and keyed in at leading and trailing edges. Tail surfaces are also detachable, with fins' slotting in between double center ribs. Struts are attached by bands stretched inside aluminum tubes (fuselage end) and wire prongs are pushed into brass tubes at the wing strut joints. Bands are chosen of a tension just sufficient to hold parts firmly in flight, but on contact with a tree or other obstruction, the wing is free to pivot and the upper strut prongs to disconnect.

Let's take the Piper *Super Cruiser*—a 40" span, 10 ounce model fitted with the *Dart* (7 x 4 prop), that has been giving us a lot of flying pleasure this last summer. The near slab-sided fuselage presents no unusual problems, but we used a building method that insures correct rigging line up, as well as providing a rugged, simple structure. For strength and lightness, the formers (1/8" sheet) are built up to eliminate cross-grain weak points. Two basic side frames are made (1/8" sq.) with sheet lower longerons at the nose, and "W" bracing for a twist free structure. These frames are joined with formers at the cabin position in the usual way, then the remaining formers and the upper stringers (1/8" sq.) are added, followed by the bearers (5/16" x 1/4"), cowl planking (3/16" x 3/32"), nose block (1/2" sheet), undercarriage (1/16" wire) and the cabin details. The motor is sidemounted and a quarter segment of the cowl made detachable for access (held in place with scotch tape). Commercial doughnut wheels of the right size were not available, so these were turned from hardwood. The interior of the cabin is doped in a neutral shade before cementing the windshield in place.

The wing construction is conventional—the right and left panels and the center section being built separately and then joined and braced at the dihedral angle. Ribs are 1/16" sheet (except for 1/8 at the center section), spars 3/16" x 1/8", leading edge 1/4" x 1/8" and trailing edge 1/2" x 1/8". The tip construction is worth a mention as it eliminates the unsightly tissue sag, so common to rounded tips. The basic tip is formed of 1/8" sheet, but the thickness is progressively built up from the trailing edge to the leading edge by adding pieces of 1/16", 3/32" and 1/8" sheet. Strut fittings, fairings and other details are finally added. The stabilizer is quite normal, with 1/8" sq. spars, 1/8" sheet outline, 1/16" ribs and a soft block fairing. The detachable fin is flat and built from 1/8" sq. and 1/8" sheet. A rubber band is passed through an aluminum tube set in the fuselage (forward of the L.E.) and the ends passed over the stabilizer to the tailskid.

The wing struts are made from 3/16" x 1/8", joined with wire at the top of the 'V' and the end attachments formed as shown in the sketch. The small vertical jury struts are simulated by rubber bands, looped from hooks set in the underside of the wing. The full size *Super Cruiser* has a cut-out in the center section leading edge, but we omitted this on the model in view of the detachable wing. This portion of the leading edge is inconspicuous when painted a neutral color to merge with the interior of the cabin. The model was covered with *Silkspan* and the finish sprayed on, using scotch tape to mask out the lettering and color division. Control surface outlines are marked in dope applied with the aid of a straight edge and a ruling pen.

The Luscombe Silvaire *8-A* and Cessna *170* feature similar wing and stabalizer construction, but the fuselages are built on the 'half-keel' principle. In the case of the Cessna, the basic left side of the fuselage (1/4" x 1/8" keels), including bearers, is built flat on the plan, then lifted up and the other half formers and stringers added. The Luscombe fuselage is built slightly differently, starting with the side keels and building the upper half of the fuselage flat on the plan, then lifting and adding the lower former halves and stringers. Again the formers are built up from several pieces of sheet (3/32"), the stringers (31/32" sq.) resting on top of the formers to allow a neat covering job to be made. Both models incorporate team racing type under-carriages, made from 1/16" dural and bolted to hard 1/8" sheet balsa platforms,

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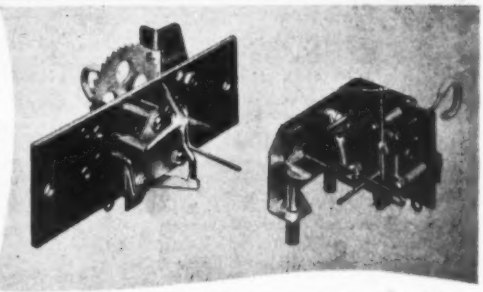

(Left) Compound Escapement, four-position, self-neutralizing, speed regulated control unit; duplicates three channel operation on single channel! (Right) Motor Control Unit, special valving arrangement for speed control and cutoff when used with Compound Escapement.

which in turn are cemented and well braced between the appropriate fuselage formers. Wheels are attached with nuts and bolts in the usual way, heavy scale types being desirable as the weight is needed up front.

We found that complex cowling curves of the Luscombe are best tackled by indenting the *inner* face of each planking strip, before cementing in position. The long fin of the Cessna is cemented to the top of the fuselage and provides a visual stabilizer line-up check. The wing fairing on this same model presents a problem and in this case we have cemented a piece of shaped celluloid to the top of the center section trailing edge. Where the Luscombe center section trailing edge butts up against the fuselage, a 45 degree angled block is inserted, so that the wing can ride up this slope in the event of a sudden shock.

The safest trim for scale designs of this type has proved to be a gentle right turn under power, which tightens up in the glide after the torque stops pulling to the left. Trimming is best achieved by adding or taking off nose weight or by making *small* adjustments to the tailplane incidence. Eliminate all warps by holding effected panels in front of an electric heater for a few seconds —at the same time twisting flat. Remember that scale models lack the stability of pylon designs, so keep that power output low on the initial flights. When you have the trim taped, be sure to key in the wing and stabilizer. And finally, may we remind you that scale models also fly away under good conditions, so fit a tip-up stabilizer D/T if the thermals round your way are really strong.

CQ Radio Control Job

(*Continued from page 33*)

also form battery compartments. Bottom stringers from station six to stabilizer are next cemented in place. A plywood floor of 1/16" stock is added between keel pieces to support batteries. Low battery location results in a very low center of gravity.

Doors are cut from 1/16" plywood and are reinforced around edges with 3/16 x 3/16" strips of balsa. Plywood is used for doors to add to strength of cabin structure, and the extra weight is well compensated for in durability.

Windshield and window glasses are of heavy celluloid which also adds to strength of the structure. The windshield center piece, which is also the mount for the front wing rubber hook, is made from hardwood from a coat hanger. Dashboard can be balsa or plywood. The original and second twin ruddered ship has a 1/16" plywood re-inforcement added to the inside of the top strips over the doors and running full length of the cabin to rear wing tie down dowel. It is just over a half inch wide, and acts as a door jam and re-inforcement for the receiver mount hooks.

The compartment behind the engine mount bulkhead contains a Walker pressure tank; enough gas can be put in to last for 15 minutes with an Arden *19*.

The Arden *19* was selected for this ship, even though it can be flown with an Arden *.09*, to permit the ship to do a full stunt pattern, including loops, immelmans, split "S," "chandelles" and "barrel rolls." These stunts all take a lot of power but, for the person new to radio control, stick to *.09* for power until you have mastered pattern flying. The *19* may be used with a good controllable restricter and large wing.

Place all wiring, drill holes for switches, meter jack, and hole for the "pot" before covering. Mount escapement and linkage and work out any binds in the system. One of the most important prerequisites of successful radio flying is a good escapement, free enough to operate down to the last winds of the rubber. This ship happened to use Control Research Radio equipment including the escapement, chosen for its small size, light weight, adjustment features, and reliability. Citizens gear with a Bonner Specialty escapement will be just as successful, though slightly heavier.

Both original model and twin rudder job fuselage are nylon covered for durability though silk or heavy *Silkspan* may be used. Nylon is put on wet over a pre-doped fuselage at point of covering contact. Pin nylon

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in place and, when dry, dope through material to stick to framework. Nylon of proper type and weight can be obtained from a department store or curtain shop, in white or a variety of colors. It is easy to dye or paint. The original ship is white, trimmed in red. Finish the job with Buyterate dope, a glow fuel proof finish.

Escapement linkage is similar to the set up of the *Rudderbug* by Walt Good (May & June 1949 issues, M.A.N.). The twin rudder push rod differs from point of contact at rear link loop from the escapement aft and rudder horn set up. Push rod is made from 1/16 wire, likewise rudder horns and extension pieces which comes up through hole in the stabilizer. This last piece is soldered to the link rod after tail section is covered. With this arrangement, it is possible to remove the tail section without unsoldering any joints.

If elevator use is desired later, install a second link loop at 90-degree angle to the rudder link. Bend rear angle outward and run through slot in fuselage side. Elevator link is then run through this rear link loop. Elevator positions then occur at normal neutrals.

This sounds intolerable, but really is not. To start with, the elevator when of equal size to rudder is only about 50 percent as effective. Only enough elevator for trim effect is used. The ship is adjusted for a little more climb than normal, then "down" elevator position is used for most normally neutral flying. Down elevator at low speed is very effective and will nose ship over but, after full flying speed is reached, will only reduce the climb to a small angle. The effect of "up" control is just the opposite. At take-off elevator is in "up" position till full flying speed is reached, then control is switched to down. At higher speeds "up" elevator is very effective and must be used with caution unless a loop is desired. Limit "up" setting to 1/8" from zero elevator position while "down" can be used as much as 1/4". The use of elevator opens up a whole new field of possibilities but proceed with caution until you are thoroughly familiar with rudder only flying. The author has run out of altitude on more than one occasion while learning to use combination control. Do not try stunts under power at a low altitude unless you like building new airplanes.

A controller box of the type illustrated by the author in the May 1951 issue of M.A.N. is essential to two control flying. For this use, mark two "off" positions as "up" and "down" respectively, to the position of the crank.

The "split-rib" type of wing construction used in the *CQ* design is new to large gas models of the radio controlled type. The designer has built four such wings for use on radio controlled ships, and has found them much easier to build, lighter in weight, more crash damage resistant and, very important, more economical to build. When covered with silk or nylon, the wing is almost indestructible due to its flexibility. The lack of rib webs between spars, in addition to weight saved, permits large amounts of twist and up and down flexing without damage experienced in solid rib construction. No notches in spars or ribs eliminate weak spots in these members.

The wing is much easier to build than to describe. A complete panel can be built in a few hours. No notching of ribs is necessary and the complete set of upper ribs will take only two sheets of 1/8 x 3" sheet against four sheets for solid type ribs. The cap strip of 1/16 x 3/16" over the contour strip between leading and trailing edge sheets, or on the small wing, between leading edge strip, prevents splitting of the contour strip experienced with rubber models or AA-powered ships when no cap strip was used. Complete weight of wing framework, with all sheet in place, is less than 12 oz. on the large wing. For violent maneuvers and high "G" pullouts from spins, the wingtips can be seen to bend upward and sometimes flutter, but to date, after many hundreds of flights, no failures have been experienced.

To start construction, make a plywood or metal template of rib shown on plan at root end of the wing. Start with a single edge razor blade and cut upper or outer curve of the rib. Drop contour template 1/4" at each end; repeat cut. This is the inside curve of the rib. It leaves a 1/4" wide strip which is the upper

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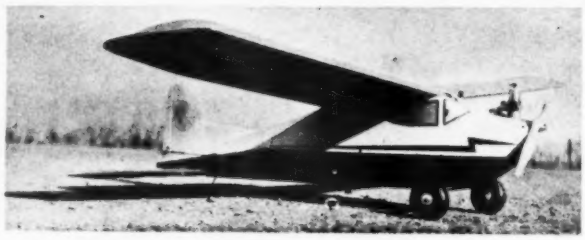

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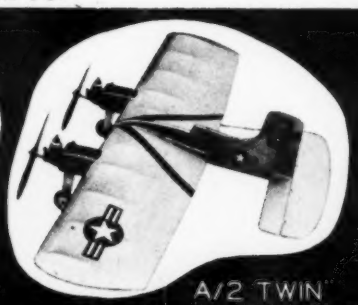

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wing contour rib. Twenty-eight each are required plus one 1/4" ribs for center and at each tip, if extra strength is desired. The lower wing rib strips are 5/32" or 1/8" square stock for the large and small wings respectively. All ribs can be cut in 15 or 20 minutes by this method. Stock may be stacked and cut with a band or jig saw, but the individual rib method is preferred by the designer. Next notch out trailing edge at each rib location 1/8 deep, and the width of the top rib contour and bottom strip, 7/32" or 1/4" for large and small wings. Ribs lap or lay alongside each other at leading and trailing edge. Pin down trailing edge, first oiling plan to prevent cement sticking to paper and to permit building opposite wing panel later from the other side. Pin down leading edge and then cement in all rib strips top and bottom. Spacing between rib strips can be maintained by using small pieces of 1/4 x 3/4" stock at main spar location while pinning contour strips in place. Mark spar locations but install spars after panel has been removed from the board. Taper spars slightly at outer end and slide in from butt end of wing. Tip ribs are from same pieces as other ribs but cut shorter and dropped a little lower when cementing in place. Cement all joints of ribs and spars at top and bottom. Add sheet leading and trailing edge, first soaking leading edge strip in water to facilitate bending over wing curve. Cement in place when dry. Raise each wingtip 1/4" at each trailing edge while sheet cement is drying. This will aid in smoother recovery from stalls. Cap strips are then cemented in place between leading and trailing edge sheeting on top only. Join panels at center, raising up each tip the amounts shown on plan for your respective wing dihedral. Add 1/16" plywood, splice gussets on each side of spars and at leading and trailing edge. The splice gussets on the small wing should be extended two bays each side of center on the main spar to distribute the load in high "G" pullouts. Finish wing structure by adding 3/16" tips and 1/16" sheeting over and under center section and on top of tips. Sand lightly and pre-dope framework at points covering with two coats of dope and set aside till later for covering. This completes the wing structure, and you have a wing which will probably last as long as two or three fuselages.

The stabilizer section chosen for the CQ design utilizes a very thin lift section. Lift sections are not usually favored for cabin type designs and use of a high lift section can have disastrous effect as witnessed by the designer when a standard *Rudder Bug* design with a modified lift section stabilizer was seen to crash in an inverted position, failing to come out of the dive after a loop.

The thin lift section was used on this design to reduce the tendency to climb too high when in straight flight and the tendency to stall when coming out of spins or fast turns. This undesirable effect can also be reduced by moving the Cg forward or reducing wing incidence but, landings after the power is off, are usually very fast. The stabilizer is set at a

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slight negative angle to trim the ship while in slow flight and the lift developed at higher speeds keeps stalls at a controllable point. Do not exceed depth of section shown on plan without some other adjustment to compensate for additional lift that will develop.

Construction of stabilizer is conventional except for the wide trailing edge which will allow for elevator cutout later if desired. The original single rudder ship has elevator control in conjunction with rudder but this is not advised for the beginner.

Lay down leading and trailing edges and main spar, then add ribs. Notice that ribs aft of your spar are 1/16" higher than nose rib section. This allows the rib to be flush with leading edge sheet, which is applied after basic frame is dry. Tip ribs are of 1/4" material because vertical fins are cemented directly to the rib on final assembly.

One-eighth diameter holes are drilled in each rib at location shown for rudder push rod, which is added later. Sheet center of stabilizer top and bottom with 1/16 sheet stock. Cut hole approximately 1/2" x 1" for the push rod extension to come up through for engagement with rudder escapement actuator linkage.

Fin and rudder are made in one piece by cementing two pieces of 1/8 x 3" stock together. Cut out shape to plan size and sand to streamline section. Leave point of attachment to stabilizer straight. Cover with rubber powered tissue or light *Silkspan*, cross grained, and surface will not warp. After three to four coats of dope and, when thoroughly dry, cut rudders loose with a sharp razor blade and add cloth type hinges. Rudder actuator link is cemented to rudder and fastened to push rod on final assembly after tail section is completely covered and doped. Cut away tissues at point of contact of fin and stabilizer for a wood to wood cement joint. Add skid to bottom of each fin to complete tail section structure. Skid attachment point can be reinforced with small pieces of crinoline (backing from adhesive tape); make sure there is no drag in rudder linkage after final assembly or rudders may jam at most embarrassing moments.

Single rudder set up is also shown on plan for those prejudiced against twin rudders, but twin rudders are a real aid in getting even turns under power and in glide. A fast turn in the last moments before landing can be quite an asset at times and this can be had without excess rudder throw sometimes necessary in single rudder ships with the usual bad effects of overcontrol under power.

A larger stabilizer is also shown on the plan to match the larger wing when the "Citizens Radio" is used, but the ship will fly with the small stabilizer with excellent control. Ex-free flighters find it hard to get used to small stabilizers of from 20 to 30 percent of the wing area but recovery is better from stalls with the smaller surface.

Test gliding and test flying are done in a conventional manner. The wing is secured with several strands of 3/16" flat rubber and stabilizer is secured with four loops of 1/8" rubber. The ship is balanced about 1/3 back from leading edge. Initial glides are made without radio gear, batteries, or propeller installed. Adjust to produce a stall free glide when ship is thrown into the wind from a running start toward a point about 50 feet away. The batteries are then added at the cg, then the radio gear.

Test glides should be straight and fairly fast because ship is small and wing loading on the high side.

First power flights should be made with radio gear installed and operating. This is a radio controlled model and many a spiral dive "wind in" or stalling crash landing can be avoided on initial flights by virtue of having control to make corrections. Adjust ship for a very large slow right circle both under power and in the glide without signal to prevent losing the ship is radio contact is lost at some future date.

Nose heavy adjustments result in quick rudder response and spins usually start within 180 degrees of turn. Tail heavy balance results in slower rudder response and turns. Turns can be made up to 360 degrees, holding full rudder constantly. Power of a .19 displacement motor should be controlled with a restrictor and held to minimum for initial flights.

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The ship is extremely stable and straight flight is possible both under power and in the glide with the same settings. Fine adjustments of turn can be made by moving only one rudder at a time by bending the link that is cemented to the rudder. Amount of throw is controlled by up or down adjustment of the extension link that comes up through the hole in the top of stabilizer. Rudder throw should be limited to 3/16" on each side of neutral for initial flights; it can be increased as experience is gained. Elevator and engine control can be added later, still using the single receiver by modification of linkage and the addition of a cam to the escapement shaft. Use of the Walker pressure tank and regulator proved a must for stunt maneuvers such as consecutive loops, split "S," and other maneuvers which result in high "G" forces which rob the engine of gas when a conventional tank is used. Should the ship develop a stall in the glide, land downwind out of a turn. If turn is excessive to one side, hold opposite rudder and land as soon as possible and make corrections by bending linkage as mentioned above. Do not over correct; ship is very sensitive to neutral setting due to large area of combined rudders.

We Test Trixter Trainer

(Continued from page 23)

inch Acme tank specified on the plan is held down by a metal strap and two small wood screws.

He also used maximum movement of both horn and bellcrank but only the first takeoff was erratic. The plane flew exceptionally smooth on 50 foot lines, though, from the spectator's view, a shade fast. Sixty foot lines added no difficulty and made things more pleasant to watch. Afterwards a 13-year old boy, who had never flown U-control, was successfully introduced to the trainer but with all control movements minimized by relocating the pushrod at both ends.

Another interesting fact stood out in these tests. Once the novice gets to feeling his oats, he appreciates that extra responsiveness. The 16-year old "test pilot" was given a well known stunt model to fly. Although, of course, he was not able to stunt it any more than he could stunt the profile trainer, due to his own limitations, he was unable to decide which plane was more fun to fly. That speaks highly for a trainer.

As a result of our tests, the *Trixter Profile Trainer*, proved itself well suited to its purpose, easy to build and having no bugs either in construction or flying; at the same time, it should make a good sport model for anyone with a need for a ship that can be thrown together and maintained afterwards with a minimum of fuss.

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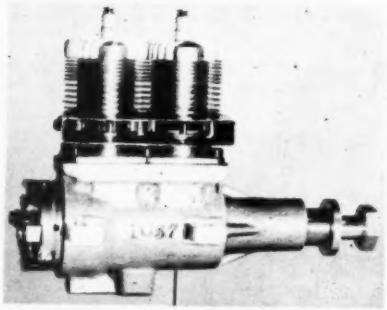
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Planes in the News

(*Continud from page 17*)

"nuisance raiders" were able to get through and dump 500-pounders into London. This will be even more true with jets—they can sneak in and out under radar and against ground targets, and there won't be much anyone can do about it.

▸ Lockheed's great *F-80*—which will be remembered by our sons as we think lovingly of the *SPAD* and the *D.VII*—has performed beyond all expectations. It carries anything and everything, hot days and cold, and has been able to take an incredible amount of battle damage.

▸ Republic's Thunderjet *F-84E* should probably have some kind of take-off assist to realize the full potential of the plane. And it can too easily run away with an experienced pilot, exceed the critical Mach number, and pull apart.

▸ There is a deficiency in our aerial camera equipment somewhere. Jessup reports that the *RF-80* has to slow down below 200 mph for photo runs because its camera gear—designed for the *P-38*, of all things—is too slow. And although there is an *RF-86* in the works, its camera bay is too small, or the P. I. cameras are too big.

▸ Armament ideas need overhauling. Cannon would be preferred, provided—and that should be in capital letters—the cannon have a rate of fire of about 1,000 rounds per minute. The 5-in. World War II rocket and the Navy's HVAR aren't much good.

▸ *Cleaner Cutlass*—Chance Vought has finally released pictures of the new *Cutlass*, which in its production version is called the *F7U-3*. It looks hotter than a little red firecracker.

The first thing you notice is that the *Cutlass* has a sawed-off look compared to the old -1. The fuselage nose is shorter and the cockpit is placed higher on the fuselage. And engine air inlets have been slanted forward further and droop somewhat, which give the plane an odd appearance from the side. There used to be considerable fin area below the wing trailing edges, too, and that has been eliminated in the new -3.

Power for the new *Cutlass* is the Westinghouse *J46* axial-flow turbojets. They just about double the old power, because they are rated around 6,000 lb. sea level static thrust each, and the Westinghouse *J34s* which were in the -1 are worth only about 3,000 lb. thrust. each.

You'll also remember that the -1 had guns in the nose. The -3 very obviously has gun ports above the engine air inlets, and there is only one reason for that—the nose has been freed to handle a full installation of radar gear.

Production of the tailless craft is in full swing at Vought's Dallas plant, and it is expected that they will be in operational use with carrier air groups by this fall.

Vought and the Navy deserve a tremendous amount of credit for having the courage to tackle a design as radical as this one and gambling against the final payoff. As a result, the Navy has a first-line jet fighter, about ready for service, which is probably the hottest service craft in the world. And I think I'd include the Hawker *P.1067* in that group, too.

▸ *Faster Fury*—The Navy and North American have also released pictures of a new fighter, the *FJ-2*, sweptwing version of the *Fury*. To nobody's surprise, the *FJ-2* looks just like the *F-86* with a coat of blue paint and a tail hook. And essentially, that's the complete roster of external changes. But there's one more important one—Navy is fitting its *FJ-2* with four 20-mm. cannon; AF, you'll remember, is getting along with six .50-cal. machine guns. The new *Fury* is in production at the North American plant at Columbus, Ohio.

▸ Piper Twin—Biggest news in the lightplane industry is that Piper has rolled a new twin-engined craft out of the plant at Lock Haven, Pa. The plane first flew on March 2, and has since been flown in single-engine trials. Designated the *PA-23 Twin-Stinson*, the plane is powered by two Lycoming *O-290D2* engines rated at 135 hp. each, turning two-bladed, all-metal Sensenich props of 6' 2" diameter.

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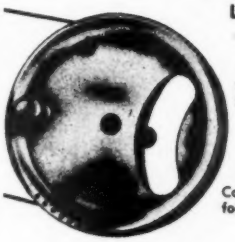

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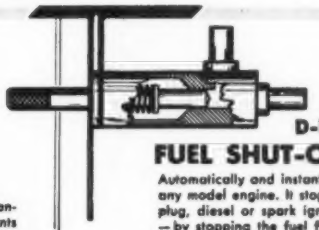

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The "Most Wanted Props" of expert and contest flyer!

AIR-O-FLITE
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70" Wingspan — .29 to .35 Engines

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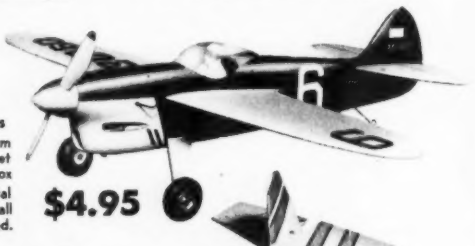
"The Quest" is the newest addition to our line of Team Racers. The design features a readily assembled sheet planked fuselage assembled on a basic fuselage box A metal cowl, celluloid canopy, formed sheet metal gear, wheels, Jim Walker "U-Control" System, all necessary hardware, and die-cut parts are included.



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Jim Saftig's "ZILCH"

KING OF ALL STUNT MODELS!

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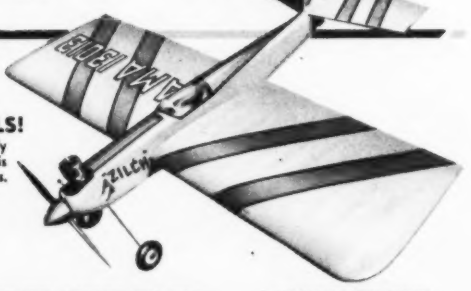

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.45 to .65 Engines
52" Wingspan
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Cabin has seating for four, with the two rear seats removable for cargo stowage. Fuselage is all-metal to the rear of the cabin, and fabric covered from there on. Wings and tail surfaces are also all-metal, which makes me wonder why Piper went to the trouble of covering the aft fuselage with fabric. That's going to mean recovering costs at periodic intervals—costs which wouldn't occur if the plane were all-metal.

Gross weight is around 3,000 lbs. Wingspan is about 34 ft., and length is 23 ft. Piper has tentatively set the asking price at $25,000.

▸ *Bi-Navion*—Out on the West Coast, there is a twin-engined *Navion* flying around. It was converted from a standard single-engine version by the Dauby Equipment Co. for its client, the Plastic and Rubber Products Co. Dauby added two Piper *Pacer* powerplants to the Navion, strengthened the wing where the nacelles were located, extended the vertical tail and they had a twin. And the cost? They're not ready to say yet, but they do say that it will be less than the cost of a Twin Bonanza or an Aero Commander.

▸ *Bits and Pieces*—Convair has finally completed the modification of over 100 *B-36A* and *B* models. They've had the jet pods added. So now SAC has a larger fleet than before of these "Big Sticks" scattered over the country in widespread locations. They're ready *if* and when they're needed. . . . General Electric Co. and de Havilland Engine Co. Ltd. of England have announced an interchange of technical information about jet engines. GE, now completely wedded to the axial-flow engine, and De H, which has been happily married to the centrifugal-flow ytpe, would appear to have little in common except the fact that neither firm had arranged for any Anglo-American cooperation before this. But De H is working on new designs, presumably axial-flow types among them, and lots of people (maybe even GE) think the centrifugal type isn't exactly through. . . . It has finally been announced that armament will be produced for the *B-47*. Somebody has finally realized that defense by speed (which we argued about some months back) is a snare and a delusion. You've got to be able to shoot at interceptors. So the *Stratojets* are going to get guns, which they should have had long ago. Some day soon they may get ejection seats (which they also should have had long ago) and then they'll be quite an airplane. . . . There's a "new" gadget called the hydro-ski which is being tested by Air Force and Navy. It can make any float plane lots faster, because it replaces the bulky float. The hydro-ski is actually an old friend called the hydrofoil, which was tested as far back as the first World War on biplanes. It worked then, and it works now. And it also worked on a Piaggio racer built in 1932 by the Italian firm for the Schneider Cup trophy races.

Scrap Box

(*Continued from page 5*)

neoprene will not do the job. Cut the sac off to the desired length. (Bill uses about 1-1/2" to 2", depending upon the engine run desired.) Slip a piece of neoprene tubing to about the middle of the ink sac. Wrap the top with thread or wire. Take a penny balloon and cut it off about an inch longer than the ink sac. Put about five drops of castor oil in it. This is *very* important as, without the castor oil, the tank is liable to break immediately from friction and the whole process has to be done over. Put the first assembly (the ink sac) inside the balloon and wrap the top again. You're now ready to install the tank in the ship. The tank is very high pressure (about 10 to 20 lbs.) when inflated. The tank should be pressed flat, eliminating all of the air before filling. A bulb is usually used to inject the fuel and it takes a bit more than the 10 to 20 lbs. to start filling the sac. Just like a balloon, it is hard to get started but uses less pressure as the tank starts to fill.

George Mueller and Jim Nightingale used one of these tanks in their 131 mph "A" record flight. Centrifugal force has no effect on this tank; therefore the engine has to

be left rich for take-off. After a few flights, the user becomes accustomed to the needle valve adjustment and "hot" flights should be consistent. This tank is a *pressure tank*, so be sure the needle valve is shut off when the tubing is hooked from the filled tank to the metering jet, otherwise your engine will flood out. Bill informs us that this type of installation makes a swell stunt tank. Total cost is approximately 17c.

• • •

Ced Galloway, ardent scale fan, feels that scale has slipped due to existing A.M.A. rules. Believes the model with the most engines and moving parts will win under these rules even though the fidelity to scale, finish, and workman ship are inferior to a single engine W.W. I model with super detail, finish, etc. In the *Burbank Model Clubs'* contests of some years ago, single and multi-engine ships were put into separate events. Some of the scale boys have talked about the possibility of a new system of scoring for proto flying scale model contests. Instead of adding points for each engine, subtract from a set score, such as 50 points for each engine, that does not contribute to the flight of the model. If the proto has a retractable gear, subtract if it doesn't operate while in flight. Same for flaps, gun turrets, etc. In that way each model would have an equal chance. Judge it to exact scale period!

• • •

Along with the Plymouth Dealers-Hartford Times Meet, to be held in Hartford June 21-22, to qualifying for the "big meet," an R.C. event will also be held plus a Wakefield and towline event. R.C. is jumping in popularity here. The 27 meg band, finally released through the persistent efforts of Walt Good, has really been a boon to this type of flying. This affair should be the biggest yet in the Hartford area. For kicks, another event on hand for the spin-dizzies who crave a new thrill. This event is being cooked up by the live New Britain (Conn.) control boys in the form of a Jalopy Race. You haven't lived—this is living—until you witness this mayhem and mass model murder. Fire all the clunkers in the area up, go out and grab your handle, along with everyone else with a crate, and get into the air. When the gang takes off for the 10, 20, or however many laps scheduled, the sight is terrific. The main idea is to get in the required amount of laps and set your "jalopy" on the deck in one piece.

• • •

Here's a solid club, the *La Salle-Peru Turf Tearers*. This gang holds meetings in La Salle, Illinois, every second and fourth Saturday evening. The rest of the Saturday evenings are spent building. A class of beginners has been started in building and flying control line models. Here's a chance for you novices in the area who want some excellent first hand experience. Contact John Alleman of Tonica, Illinois.

• • •

June Dyer gave us a rundown on the Mather Field Meet (8th N.C.F.C.C. sponsored). The Council had bribed the weatherman to give them a break, as weather had been for the ducks for days previous to the contest. Entries 131, waded in and competed. C. D. Mario Bertolucci and Head Timers Hal Simmons, Lee Ross, and Tom Moore sparked the contest throughout the day, and all hands agreed the meet was a dandy.

• • •

The Exchange Club of Olando, in presenting the Tangerine Internationals in Florida this year, suffered growing pains. About 300 more planes arrived than anticipated but, with the combined efforts of contestants and officials, the meet soared to a successful close with a barbecue provided by the Exchange Club. Trophies (154) were awarded. Over 250 contestants, representing 25 states, including the District of Columbia and Cuba, registered a thousand planes. Manuel Tellez, President of the Federacion de Aeromodelismo de Mexico, stated the gang would be out en masse for the Third T.I. The Orlando Air Force Base provided housing for 25c per night and the 838th Engineer Aviation Battln. Co. B provided hot lunches at 35c. (The End)

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Complete Kit— $4.95

NORTH AMERICAN AT-6 "TEXAN"

(U. S. Navy Designation SNJ-5)

Wingspan—¾" scale—For "19" to "33" Engines

The "T-6" has been taught more people to fly than any other airplane. Hundreds of thousands of pilots who flew this plane will thrill to see this model perform. Beautiful to look at and easy to handle. With its stunt airfoil, it can do everything in the rule book.

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DEEP DRAWN METAL COWL
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$4.95

Grumann "F-8-F BEARCAT"
35½" Wingspan—For .29 to .65 Engines
Features "Autotrol" rudder operation, eliminating slack control lines in critical maneuvers.

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"MINNOW" Cosmic Wind
28" Wingspan—For .09 to .36 Engines
This 1½" scale Goodyear racer features "Step Keel" construction. Meets Team Racing rules.

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North American "T-28"
30" Wingspan—For .23 to .36 Engines
This new Air Force trainer makes a perfect stunt-scale design. Tricycle gear, pre-fab.

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CESSNA "195"
36" Wingspan—For .19 to .49 Engines
This beautiful 1" scale controline lightplane kit is pre-fabricated. Features "Step Keel."

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Republic "P-47 THUNDERBOLT"
40¾" Wingspan—For .29 to .65 Engines
Engine throttle control, fully automatic wing flaps, shear-pin mounts and die-cut parts.

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37" Wingspan—For .19 to .36 Engines
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27 m.c. Crystal Control

RADIO CONTROL

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The First Transmitter You Can *Build, Operate,* and *Maintain* Yourself!

CRYSTAL-CONTROLLED "SUPER AEROTROL"

SAVES MONEY—SAVES TIME . . . (No need to return to factory for minor adjustments and repairs.)

- **Backed by the most experienced builders of radio control equipment (over 4,000 Aerotrol Units to date).**
- **Proven by dozens of Contest Winnings.**
- **First to fly from dawn-to-dusk, landing only to refuel.**
- **Sold and serviced through local Hobbycraft Dealers.**
- **Super-Aerotrol has been tested under the Academy of Model Aeronautics special license in various parts of the country for nearly a full year. In addition "Super-Aerotrol" has been sent to England for tests on their license-free band. Here is what the experts say:**

BILL WINTER—Editor of MODEL AIRPLANE NEWS says:

"Put together an Aerotrol Kit . . . the results were startling . . . worked right off the bat."

PETER CHINN—technical writer for "MODEL AIRCRAFT" of "England" says:

"In our experience the only thyratron set reasonably free from trouble . . . the Aerotrol has always been known for its good performance . . . the (27 mc.) equipment was tested on its arrival from the United States and found to work perfectly."

WARREN BARTLETT— test flying Super-Aerotrol on Academy of Model Aeronautics special license KG2XDA says:

"First flights peachy . . . receiver checked out perfectly adjusted."

Still Available! **DE-Aerotrol** (for 52 mc.) Complete Kit—**$22.95**

Includes Transmitter, Receiver, Escapement (less batteries and tubes).

XFG-1	Receiver Tube	$3.50
3A5	Transmitter Tube	3.50
DE-105K	Escapement Kit	2.95

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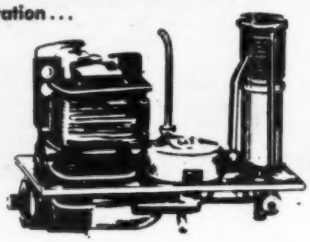


DUST-CORE TUNED Super Aerotrol RECEIVER

- Operates on either 27.2 or 52 mc.
- NEW super-sensitive relay.
- NEW "locked-channel" dust-core tuning. (We have shipped the sample receivers across the country and to Europe without the frequency changing!
- Light in Weight, 2¾ oz. less batteries.
- Simple super-regenerator circuit, 100% dependable.

Kit includes: Finished, tested sensitive relay; finished dust-core tuner; drilled bakelite base with condensers and eyelets attached; all electrical components, condensers, resistors, coils, chokes and potentiometer; all necessary contacts, and color-coded wiring. Can be assembled in less than two hours. Complete building and operating instructions are included

Kit— **$13.95**

Crystal-Controlled Super Aerotrol TRANSMITTER

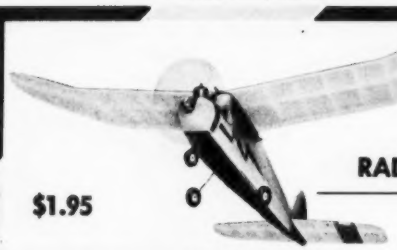
- Operates on 27.255 mc.
- Completely portable—Self contained—No separate antenna—No external Batteries!
- Weighs 3.5 lbs. complete!

Kit includes all necessary parts (except tube and batteries): Precision Ground Crystal; Painted Metal Cabinet; Finished Sectional Antenna; stamped and formed chassis with all holes punched; all necessary components, resistors, condensers, coils and chokes; color coded wiring. Can be assembled in less than two hours. Complete building and operating instructions are included—

Kit— **$21.95**

*Prices and specifications subject to change.

RADIO & PAA-Load Designs . . .



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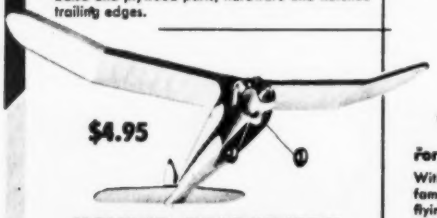
BRIGADIER "R. C.-38"

For .035 to .099 Engines—38" Wingspan

This completely re-designed "½ A—A" Free-Flight may be flown as a Radio Control job, a PAA-Load model, or a free-flight Sport Flyer. Plans include Radio Control and PAA-Load installation details. The kit is pre-fabricated with formed gear, die-cut balsa and plywood parts, hardware and notched trailing edges.



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"SUPER BRIGADIER"

38" Wingspan—For .19 to .36 Engines

Especially designed by Henry Struck for Radio Control and PAA-Load flying. Plans show details for installation of equipment. Pre-fabricated.

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"SUPER BUCCANEER"

For .60 to 1.20 Engines—90" Wingspan

With over 200 contest prizes under its belt, this famous 7½ foot craft is perfect for radio control flying. Features a modified Eiffel airfoil section, 8.3 sq. feet of wing area, and a multispar wing. Ample cabin space for radio work. Weighs 5½ pounds.

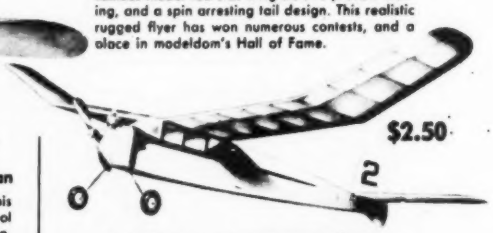
BUCCANEER "B" SPECIAL

For .23 to .36 Engines—56" Wingspan **$3.95**

BUCCANEER "C" SPECIAL

For .45 to .65 Engines—72" Wingspan **$7.95**

Perfect for sport and radio-control flying, this famous model features wing slots to prevent stalling, and a spin arresting tail design. This realistic rugged flyer has won numerous contests, and a place in modeldom's Hall of Fame.



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½A PAA-Load "BOOTSTRAPS"

40" Wingspan—For .035 to .049 Engines

Designed by Henry Struck for sport and PAA-Load contests, this easily built pre-fabricated kit features "Auto-Semble" construction.

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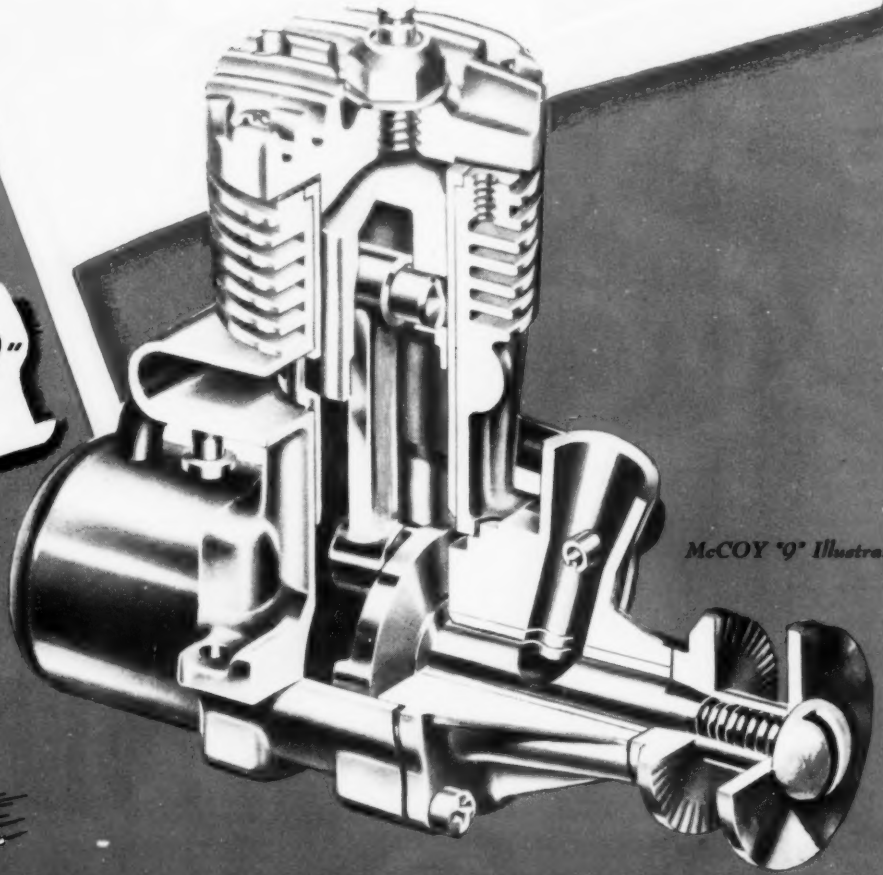

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